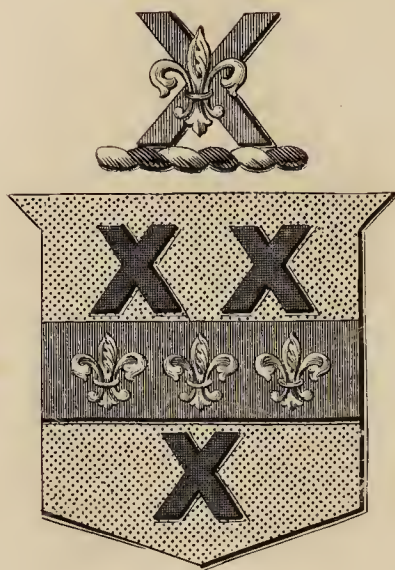




42, 131/B



E. BARCLAY-SMITH, M.D.





Digitized by the Internet Archive  
in 2018 with funding from  
Wellcome Library

<https://archive.org/details/b30500801>



4811— P. J. Ling  
A  
S Y N O P S I S

O F

A COURSE of LECTURES

O N

Anatomy and Surgery;

By MAGNUS FALCONAR,

S U R G E O N,

And PROFESSOR of ANATOMY.

---

SEGNIVS IRRITANT ANIMUM DEMISSA PER AURES,  
QUAM QUÆ SUNT OCULIS SUBJECTA FIDELLIBUS.

HOR.

---

L O N D O N:

Printed by J. DIXWELL, No. 148, *St. Martin's Lane*, near  
*Charing Cross*.

M.DCC.LXXVII



---

---

TO THE  
Students of ANATOMY

IN L O N D O N.

GENTLEMEN,

**Y**OU are engaged in the study of a science, scarcely more interesting to mankind, than profound and difficult to be attained. To explain and facilitate it, has, at different periods, employed the pens of many, and was the object I proposed to myself, in compiling the following sheets. The



#### 4. TO THE STUDENTS OF

plan, which, you will observe, Gentlemen, has hitherto been unattempted, is calculated to answer three very important purposes; First, to free beginners from the necessity of perusing the abstruse treatises written on the subject of anatomy, which, by their tediousness too often disgust, and more frequently confuse than enlighten the understanding; Secondly, by a radical and minute explanation, to simplify the terms of art, that occur in the course of each lecture, and by this means, completely to remove an obstacle, which students even of the best classical education, are, it is well known, sometimes, at a stand to surmount. Finally, I have had it particularly in view, to effect a discontinuance of the practice of writing,

ting,

ting, in time of lecture; *a practice* not less painful and disagreeable, in the Winter months, than destructive of the very good it is intended to produce. Whilst an anatomical subject is explained, or demonstrated, it is necessary the senses should be perfectly disengaged and free, which, you will readily believe, Gentlemen, can never be the case, when the eye is diverted from the object, and the mind busied in committing to paper a few broken, unconnected sentences, collected hastily, as they flow from the professor's mouth. In such a divided state of the understanding, it is astonishing to observe, how grossly matters are misconceived and facts mistated. What I here affirm, I know by  
ex-



experience, and in confirmation of the truth of it, might appeal to every gentleman, who, in the course of his anatomical studies, followed the practice, it is my wish, for the future, to prevent. That I shall see this *wish* accomplished I have every reason to hope, when the student finds collected in this book, and carefully disposed in order, the essential and most interesting parts of each of my lectures; when he finds judiciously pointed out, more than his most unwearied diligence would be capable of effecting; in a word, when he reflects, that, by a few additional remarks made on the interleaves, after lecture, or occasionally during lecture, as the circumstance may permit, he will see himself, at the  
end

end of one or two courses, possessed of a complete Treatise on Anatomy, which he may, not improperly, consider as his own. If I should appear to any one rather sanguine in the expectations I form on the present subject; it is the effect of the uncommon encouragement given to the undertaking by several Gentlemen of the first eminence in the profession, who have all been pleased to think, it bids fairer, than any other plan hitherto adopted, to render the Study of Anatomy more agreeable and easy. This might be deemed a sufficient reason; yet I will beg leave to add another. It is, Gentlemen, *the effect* of the desire I feel, of fulfilling, in the amplest manner, my engagements with you, and of return-  
ing

8 TO THE STUDENTS, &c.

ing, as far as in me lies, the favors you  
confer on,

GENTLEMEN,

Your obedient,

and very humble Servant,

MAGNUS FALCONAR.

*Craven Street, Strand,  
September 26, 1777.*



---

---

A  
S Y L L A B U S, &c.

---

*Lecture the First.*

Introduction to the Study of  
Anatomy.

---

Section the First.

*On the Component Parts of an Animal  
Body.*

GENERAL observations on the  
fluids contained in an animal  
body,—Blood is given to all ani- Blood.  
mals,—when circulating in the vessels,  
or flowing from the animal, appears  
\*homogeneous,—when exposed to the

---

\* Homogeneous, ὁμογενής, from ὁμός *similis*, and  
γενος *genus*, having the same nature or principles.

Blood. air, separates, spontaneously, into two parts, †serum and §crassamentum,—Crassamentum sinks in the serum, but sometimes swims from the surface becoming dry‡.

*Of the Blood.*

Blood—divided into three parts, viz. serum, coagulable lymph, and red particles,—Colour, in man,—quadrupeds,—birds,—fish,—and the amphibia, red—In some insects, green,—In water insects, colourless and transparent,—Salt to the taste,—of a gummy nature,—readily mixing with water.

Specific gravity, by Boyle,  $\frac{104}{1000}$ ; by Dr. Jurin,  $\frac{1054}{1000}$ ,—differs in different animals,—and in animals of the same class from various circumstances, as health, &c.

† Serum, the watery fluid which separates from the red part; so called from its similarity to whey.

§ Crassamentum, the red cake or cruor swimming in the serum, which consists of the Coagulable Lymph and Red Particles.

‡ A needle may be made to swim on water.

Red



Red Particles, commonly called Globules, and by Father de la Torrè, supposed \*annular,—are more numerous, in proportion to the perfection and health of the animal,—in the lower classes of animals are few,—give the colour to the blood,—size, different in different animals,—in the human body 3240th part of an inch,—shape, in the human body, flat and round, like a piece of money,—in some animals, oblong or elliptical,—each particle is a compound, solid body, flat and round, consisting of two parts, viz. a small solid particle, called the central particle, and an external covering or vesicle, in which the former is contained like a pea in a bladder,—may be seen in the microscope,—the process explained,—the particles may be made spherical by an addition of water,—by a mixture with a solution of neutral salt, may be, again, restored to their original flat figure,—are not more oily, saponaceous or inflammable than the other parts of the blood,

Blood.  
Red Particles.

---

\* Annular, like a ring.

—an inquiry into the opinions of Senac and other authors, on the properties of the red part of the blood,—soluble in water and other fluids†,—the proportion of the red particles, in an healthy man, about  $\frac{1}{8}$  of the whole mass.

Coagu-  
lable  
Lymph.

Coagulable Lymph, whilst in the course of the circulation, is supposed to be, of all parts of the blood, the most subtile; but, when out of the course of the circulation, or when received into a vessel and exposed to the air, becomes a solid,—it gives the firmness to the crassamentum,—forms the large masses in aneurisms,—plugs at the extremities of divided vessels,—polypi,—moles, or false conceptions,—membranes,—hairs,—worms of the blood, &c.—these explained,—it may be separated from the other parts of the blood, by various means,—An inquiry into the causes of coagulation, with observations on some morbid appearances of the coagulable

---

† Vide Experimental Inquiries, Vol. III. Ch. 1.

‡ Fibrous of Malphegii. Gluten of Davies, &c.



lymph,—when once coagulated, is insoluble except in strong acids, alkalies, &c. by which its properties are destroyed.

Serum, a watery mucilaginous fluid, Serum.  
 —separates from the crassamentum, spontaneously,—divided into serum and serosity,—colour, in health, a blue-  
 ish yellow,—is homogeneous,—coagulates in 160° of heat of Fahrenheit's thermometer, like the white of an egg,—neutral salts in the serum,—  
 their use. X

\*Heterogeneous substances occasionally contained in it, as oil in globules, &c.—inspissated serum soluble in water.

Observations on the chymical analysis of the blood,—on the proportions of the different parts,—on the iron found in the blood, &c.—on the difference of colour, between arterial and venous blood.

Further observations on the coagulability of the blood, with an inquiry

---

\* Heterogeneous, from *hetero* *alterum*, another, *genus*, kind,

## 6      *Of the Cellular Membrane.*

into the causes of coagulation,—  
The morbid appearances of the blood explained, with an account of the changes produced on the blood by inflammation,—\*polypi, how formed,—extravasated blood, how absorbed.

Observations on blood-letting, and on the treatment of hemorrhages†.

### *Of the Cellular Membrane.*

All parts of an animal body are formed of membranes, fibres, or inorganic matter,—each of these, originally, made from the fluids by secretion or some other process,—fibres differ in their degrees of organization.

Cellular  
Mem-  
brane.

‡ Cellular Membrane, the most simple or least organized fibre,—found, universally, in all parts of an animal

---

\* Polypus, from πολύπους, from πολυς, *multus*, and πους, *pes*, a foot, an animal having many feet; is here applied to a concretion of blood in the heart, or in the large arteries near the heart.

† Hemorrhage, from αἷμα, *sanguis*, blood, and ῥέω, *fluo*, to flow—a violent effusion of blood from any part of the body.

‡ The Tela Cellulosa of Haller.



body,—is the common connecting medium,—is exceedingly ductile, allowing of easy motion,—the necessity of such a connecting medium demonstrated,—has interstices moistened by a fluid called \*interstitial fluid.

Cellular Membrane, improperly so called,—in most parts of the body bears no resemblance to a membrane,—is not cellular,—division into †reticular substance and ‡adipose membrane,—adipose membrane not universal,—wanting in the scrotum, eyelids, and penis.

Texture Reticular,—how demonstrated,—readily admits fluids to pass from one part of the body to another, as air, water, &c.——Observations on the §emphysema,—on air extricated

---

\* Interstitial Fluid, a fluid secreted on all the internal surfaces of an animal body, for the purpose of lubrication——*vide* Interstitial Fluid.

† Reticular Substance, from *rete*, a net, the texture of these fibres resembling net-work.

‡ Adipose, from *adeps*, fat, the apparatus in which the fat is contained.

§ Emphysema, from *εμφυσμα*, a disease in which the air that was before in a fixed state, is let loose into the interstices of the reticular substance, inflating the part.



by putrefaction;—the smallest fibre of the reticular substance, how formed, —Blood Vessels seen in the large masses —An inquiry into the opinions whether the minimi of the animal body are inorganic, —Observations on the formation of Adhesions.

Adipose  
Mem-  
brane.

Adipose Membrane, how differing from the reticular substance, —improperly called membrane, —a large gland extended throughout most parts of the animal body, —why not in all parts, —formed of small \*cells, —these cells do not communicate, —each cell surrounded by a network of arteries and veins, —An inquiry into the manner in which fat is formed, —proofs that it is a secretion, —An inquiry into the use of the fat, —why distributed, so generally, throughout the human body, —finite use, as a reservoir of nourishment, —fat, of all other animal substances, the most nutritive, —proved by experiments, —least liable to putrefaction, —fat in the fœtus differs from that in the adult, —in

---

\* Cell, a small bag or bladder.

young animals, found principally on the exteriors of the body,——an inquiry into some of the diseases of the cellular membrane,——\*anasarca,——diffused †aneurism,——‡ecchymosis,——§abscess,——how formed,——why circumscribed,——observations on inflammation,——on the formation of pus,——proofs that pus is a secretion,——observations on the quick absorption of fat producing white serum,——its symptoms and method of cure explained,——on the absorption of fat from disease,——fatty tumours, how formed,——how remedied.

---

\* Anasarca, *ανασαρκα*, from *ανα*, *per*, through, and *σαρξ*, *caro*, flesh; a species of dropsy, when the water is contained in the interstices of the reticular substance——This disease is also frequently called leucophlegmatia, from *λευκον*, *album*, white, *φλεγμα*, *pituita*, phlegm,

† Diffused Aneurism, from *ανευρυνω*, *dilato*, to dilate, (in surgery) signifies a wound of the artery, and the blood diffused into the reticular substance of the limb.

‡ Ecchymosis, from *εκχυνω*, *effundo*, to pour out, and *αιμα*, *sanguis*, blood; blood extravasated from ruptured vessels under the skin, discolouring or giving a blackness to the part, generally attended with contusion, as the black eye, &c.

§ Abscess, a tumour containing pus.



*Of Ligaments.*

Ligaments.

Ligaments, very universal in the animal body for the purpose of tying parts together,—of two kinds, elastic and inelastic.

Elastic Ligaments.

Elastic Ligaments,—of a yellow colour,—have few blood vessels,—are but little organized,—specimens in different parts of the body, as between the vertebræ, &c. &c.—use in man,—in quadrupeds,—its action has no dependance on the will,—therefore not fatiguing, or expensive to the constitution.

\*Elasticity not confined to animated matter.

Inelastic Ligaments.

Inelastic Ligaments,—colour white, like burnished silver,—how distinguished from the elastic,—its organization explained,—given to connect parts where stability is required, as bones, &c.—to prevent luxation,—

---

\* Elasticity is a power which some bodies possess, of constantly and equally, endeavouring to contract themselves to that form, from which they have been distorted; in animal matter, its action is the same in the dead as in the living body.

luxations

luxations attended with lacerations of the ligamentous fibre, unless from disease,—the inelastic more vascular than the elastic ligament,—has nerves,—is but little sensible in a sound state.

*Of the Ligamentous Fibre.*

Inflammations of ligamentous parts attended with great pain.

Tendons formed of the inelastic ligamentous fibre, are vascular,—have nerves,—external surfaces smooth and polished,—use, to connect muscle to bone. Tendons.

† Fasciæ, tendinous expansions,—formed of the ligamentous fibre,—found in different parts of the body,—are vascular,—have nerves,—their uses explained,—interosseous ligaments, what. Fascia.

*Nervous Fibre.*

Nervous Fibres take their origin from the brain and spinal marrow,—— Nervous Fibres.

---

† Facia, from φασηια, a band, by the ancients called aponeurosis, from απο, de, from, and νευρον, a nerve, from an erroneous supposition that it was formed by an expansion of a nerve.



Brain, a general description of,—division into cerebrum, cerebellum, medulla, oblongata, &c.—nerves,—their number in the human body,—how rising from the brain, &c.—Brain,—substance vascular, soft, tender, of a pulpy texture,—has three coverings, dura mater, tunica \*arachnoides, and pia mater,—nerves,—covered by the same coats,—are strong, white, inelastic chords,—substance of the nerves soft, as in the medulla,—each nerve, a †fasciculus of smaller threads,—smallest fibrile computed 32400<sup>th</sup> part of a common hair,—supposed distinct threads from their origin to their termination,—on the distinctness of sensations,—plexus of nerves explained.

ganglion

Ganglion, a swelling on a nerve,—substance, softer than the nerve,—

---

\* Arachnoides, from *αράχνη*, a spider, and *ειδος*, form; so called from its supposed resemblance to a spider's web.

† Fasciculus, a little bundle.

‡ Ganglion, ΓΑΓΓΑΙΟΝ, in anatomy, signifies a swelling upon a nerve; in surgery, a collection of synovia in the course of the tendons.

more



more vascular.—Nerves distributed to all parts,—are the instruments of sensation and motion,—how far demonstrable,—modified to convey different impressions :—general observations on the \*phænomena of the nerves,—also, on the different theories relating to them,—brain, the sensorium commune.—Nerves, the agents by which the mind acts on the machine, and is again acted upon.

*Muscular Fibre.*

Muscular Fibre makes all that part of the animal body called flesh,—colour, red in man and quadrupeds,—in some birds and fish, white,—red colour, not inherent in muscle,—muscle may be made white,—parts may be muscular, tho' not red, as the iris, &c.

Muscular  
Fibre

Fasciculi of fibres explained,—the ultimate fibre too small to be demonstrated,—muscles, in the dead body, soft and inelastic,—in the living, ca-

---

\* Phænomena, plur. of phænomenon, from φαίνω, *appareo*, to appear.

pable of exerting great force,—have arteries, veins, nerves and lymphatic vessels:—An inquiry into the supposed structure of the smallest fibrile:—On the phænomena of muscular action,—power, different from elasticity,—action not constant,—dependant on the nervous influence,—may be exerted by stimuli,—stimuli, of different kinds,—mental stimulus, what,—mechanical, what, &c.—This power of contraction called irritability,—An inquiry into the doctrines of sensibility and irritability;—muscles become stronger, in proportion to the frequency and energy of their action.

### *Of the Arteries.*

Arteries. \*Arteries, hollow, elastic tubes, beginning from the heart, to carry blood to the different parts of the body,—their number, two; aorta and

---

\* Artery, from ἀήρ, *aer*, air, and τηρεῖν, *tereo*, to keep; was first applied to arteries, by Erasistratus, at the school of Alexandria, from an hypothesis that they carried the finer parts of the blood mixed with air, which formed the animal spirits.



arteria pulmonalis.—A general description of the circulation of the blood.—The course of arteries always in the centre of the body, or limb, taking the shortest tracts to the parts they are to supply,—are defended from compression, &c.—branches, near the heart, go off at obtuse angles,—the further from the heart, the angles the more acute,—use of obtuse angles, to lessen the momentum of the blood,—plexus of arteries explained,—arteries, on some parts, run convoluted, as on the uterus, testis, &c.—divided into three classes, sanguiferous, seriferous, and lymphatic,—this division how far necessary, to account for many phenomena,—how demonstrable.—Capillary arteries, what,—exhalant arteries, what,—\*anastamoses, their use,—where found,—not met with in glands,—coats of arteries, three

---

\* Anastamosis, from *ανα, per*, through, and *στομα, os*, a mouth; is by the moderns used to signify the opening of one vessel into another; but by the Greeks was used in a different sense, *viz.* a termination of arteries on surfaces, from whence the term, bleeding by anastamosis.

in number,—may be separated,—the external coat has fibres, in all directions,—the second has circular fibres,—the internal, a smooth, dense membrane to prevent \*transudation,—are connected by the reticular substance,—are elastic,—besides these, arteries have muscular fibres,—how demonstrated,—are irritable,—|| valves of arteries, where placed,—their use,—Vasa vasorum, what?—their use,—artery, in a transverse section, always a circle,—An inquiry into the opinions whether arteries are †conical or ‡cylindrical,—are conical,—the apex of the cone in the heart,—the sum of the lights of all the branches,

---

\* Transudation, from *trans*, through, and *sudo*, to sweat; an oozing of the fluids contained in vessels through their coats; also, sometimes, called diapedesis, from *δια*, *per*, through, and *ανδω*, *salio*, to leap.

|| Valves, little membranes that stop the return of the blood, from *valvæ*, folding doors.

† A cone, whence conical, means a circular figure, or, in anatomy, a vessel gradually becoming smaller, the larger extremity of which is called its base, or basis, the narrower, its apex.

Cylinder, whence cylindrical, a figure, or vessel, whose diameter is the same in all its parts, contrary to the cone.



considerably, larger than the trunk. ---  
 Does a vessel independent of its giving  
 of branches, become larger? --- on  
 the motion of the blood in the arte-  
 ries, --- on the pulsation of arteries, ---  
 the \*systole and †diastole of arteries  
 explained, --- on the impetus of the  
 blood, --- an inquiry into the doctrine  
 of pulses, --- pulses divided into the  
 following kinds.

*Fortis, Debilis.*

*Plenus, Parvus.*

*Celer, Tardus.*

*Frequens, Rarus.*

*Mollis, Durus.*

*Regularis, Irregularis.*

*Intermittens.*

Observations on the manner of feel-  
 ing the pulse, with an explanation of  
 the above terms. --- Arteries termi-  
 nate in veins, on surfaces, and in the  
 cells of glands.

---

\* Systole, the contraction of the heart and arte-  
 ries, from συστέλλω, *contrahō*, to contract.

† Diastole, the dilation of the heart and arteries,  
 from διαστέλλω, *diduco*, to set open.

*Of the Veins.*

**Veins.** Veins are elastic tubes, terminating in the heart,—the reverse of arteries,—found in all parts of the body,—thinner and denser than the arteries,—when cut, collapse,—are seven in number, *viz.* two cavæ, four pulmonary, and the vena portarum,—have vasa vasorum similar to arteries,—begin from arteries, only, by continuity of canal,—are divided into three classes, sanguiferous, seriferous, and lymphatic; corresponding with the three classes of arteries,—fluids pass readily from the arteries into the veins,—continuity of canal demonstrated,—coats of veins, three in number, similar to those of arteries,—may be separated in the large veins,—are denser and less elastic than in arteries,—have muscular fibres,—are irritable,—how demonstrable.—Valves, how formed,—commonly two in number,—very numerous in the extremities,—always make a swelling on the vein,—wanting in the veins of the viscera, heart, brain, &c.—an inquiry into their use;—the smallest veins, probably, without valves.—



Veins more numerous than arteries,—are larger,—consist of two sets,—one, deep-seated, accompanying the arteries,—the other, superficial, lying under the skin, called cutaneous.—Vena portarum described,—veins of the viscera always attend the arteries,—motion of the blood in the veins, in an equal stream, not like that of arteries,—a comparative view of veins and arteries,—veins, conical,—apex terminates in the heart,—may pulsate near the heart,—cause explained.—An inquiry into the quantity of blood supposed to be contained in the human body,—this, different in different persons,—probably greater in lean than in fat people,—on a medium, supposed to be from twenty to thirty pounds,—how often does the mass of blood pass through the heart?—if thirty pounds, in less than two minutes,—the calculation explained.—Reflections on \*phlebotomy,—on †arteriotomy:—observations on

\* Phlebotomy, blood-letting, from φλεψ, *vena*, a vein, and τεμνω, *seco*, to cut.

† Arteriotomy, the opening of an artery, from αρτηρια, an artery, and τεμνω, to cut.



## 20    *Of the Lymphatic System.*

the doctrines of derivation and revulsion, with some practical remarks.—  
On the \*varix,—the manner of treating varices.—On the diseases of the venous system.—Offication of arteries,—its consequences considered, further observations on hemorrhages,—and on the means used to restrain them under different circumstances; —hemorrhages, frequently salutary.

### *Of the Lymphatic System.*

Lympha-  
tic system

General reflections on the manner, in which the animal body is nourished.—Lymphatic System, generally, divided into three parts, viz. lymphatic vessels,—lacteals and thoracic duct.

Thoracic  
duct.

Thoracic duct the trunk of the system,—its situation,—extent,—size.—*Receptaculum Chyli*,—how form'd,—thoracic duct has blood vessels, nerves and muscular fibres, has three-coats similar to veins,—terminates in the

---

\* Varix, a diseased enlargement of a vein from inflammation.

angle between the jugular and subclavian veins, on the left side.

Lymphatic vessels.

Lymphatic vessels exist in every part of the body,——definition of the term,——differ from lymphatic veins,——have a great number of valves; five or six pairs in every inch,——their coats dense and transparent,——are supposed three in number, like veins,——are too delicate to be separated,——have muscular fibres,——proofs of their existence;——have *vasa vasorum*, originate from surfaces only,——absorb like capillary tubes,——proofs that they do absorb;——terminate in the thoracic duct,——consist of two sets, external and internal,——internal accompanying the larger arteries,——external, or superficial, like the cutaneous veins, lying immediately under the skin,——the two sets communicate,——their communication demonstrated,——lymphatics, coming from the right side of the neck and right arm, open into the angle, between the jugular and subclavian veins, on the same side;——lymphatics, on the right side of the thorax, pass under the aorta.

Lacte-



**Lacteals**

Lacteals arise from the internal surface of the intestinal canal,—absorb the nutritious part of the aliment,—terminate in the thoracic duct:—structure corresponds exactly with the lymphatic vessels;—orifices of the lacteals demonstrated.

**Lymphatic glands**

Lymphatic glands defined,—situation in the course of the lymphatic vessels;—have arteries,—veins,—nerves,—lymphatic vessels, and cells,—the lymphatic vessels, in their passage to the thoracic duct, enter and pass through them,—this process explained.

An inquiry into the properties of the fluid, secreted by the lymphatic glands.

An account of the discovery of this system,—lacteals first discovered by Azellius, in a kid, 1627—receptaculum chyli, and thoracic duct, by Picquet, 1661,—the lymphatic vessels by Rudbec, in Sweden, 1662,—and, about this time, by Bartholine, in Denmark; and Dr. Joliffe, in England.—In the year 1768, Mr. Hewson completed the discovery of



of this system, by demonstrating the existence of the lymphatic vessels, in birds, fish, and \*amphibious animals.

Lymphatics, the only system of absorbents,—proofs that they are so,—1st, their analogy with the lacteals,—2dly, the ingress of poisons into the body, as of the venereal, variolous, cancerous, &c. inflaming the glands through which they pass,—3dly, the absorption of matter from ulcers, &c.—4thly, the fluid contained in the lymphatic vessels, being similar to the fluids contained in those cavities, from which the lymphatic vessels arise,—5thly, the existence of the lymphatic system in all animals.—an inquiry into the prevailing opinions, previous to the discovery of the lymphatic system.—A refutation of the arguments brought in favour of absorption by red veins.

---

\* Amphibious, from *αμφω ambo*, or *αμφι utrinque*, and *βιος, vita*, life; animals that can live in two elements.

## Of Glands.

Glands.

† An inquiry into the utility of glands, and of secretions in general. — Gland, a name given to all parts, particularly organised, for the purpose of separating from the blood fluids of different properties, to be applied to the various uses of animal œconomy, or to be thrown out of the body, as useless or hurtful, — known in the early ages of anatomy. — Sylvius' division into two kinds, ‡ conglobate and \* conglomerate, — his ideas exploded; — divided into two classes, simple and compound, — simple gland explained, — may be formed by an artery only, — this the most universal in the animal body, — proved to exist in all parts.

---

† Gland, *αδην*, *glandula*, an acorn; a term, originally, given by the Greeks to the lymphatic glands only, from their supposed resemblance to acorns.

‡ Conglobate smooth on its external surface.

\* Conglomerate, on the external surface, rough and irregular.

Com-



Compound glands defined,—are of different kinds,—secrete fluids of different properties,—glands of this class correspond with each other in their general structure,—have arteries,—veins,—nerves,—lymphatic vessels,—excretory ducts and cells.—Arteries divided into small branches, investing each particular cell of which the gland is composed,—in some glands, have one centre of ramification ;—ramification of arteries, different in different glands,—smallest branches, called exhalants, open into cells ;—veins return the blood from the arteries,—arteries going to glands, differently constructed,—are denser than those going to other parts,—collapse, when cut through,—are more muscular.—An inquiry into the opinions, concerning the changes produced on the coats of arteries entering glands,—on the coverings of glands,—how formed,—their use ;—the excretory ducts arise from the cells,—cannot be injected from the arteries, or veins, unless by rupture.

Excretory Duct, how formed,—has muscular fibres,—lymphatic ves-



fels arise from its internal surface,—their use, to depurate the fluid,—cells may be filled by injecting the excretory duct,—excretory ducts of different glands, differently constructed,—lymphatics, excretory ducts to some glands,—the fact demonstrated.

*On particular Glands.*

Glandula  
Adiposa.

Glandula Adiposa, commonly called adipose membrane,—an apparatus extended throughout most parts of the body, for the secretion of fat,—consists of cells, which do not communicate with each other,—each cell surrounded by a network of blood vessels, nerves and lymphatics,—lymphatic vessels arising from the cells become excretory ducts to this gland,—these facts demonstrated.—Proofs that fat is a secretion, and not a mere filtration,—reflections on the manner in which fat is secreted,—an inquiry into the use of fat, in the human subject, and other animals,—on the diseases of the adipose gland.

Kidney.

Kidney,—figure, different in different animals,—found in all animals,—

mals,—its general structure the same in all ;—consists of two parts, called cortical and tubular,—these parts vary in their proportion in different glands. The kidney has an artery, a vein, nerves, lymphatic vessels and excretory ducts,—the uses of each explained.—Observations on the difference of ramification of arteries in different glands,—*corpora globosa*, or *cryptæ* of Malpighii, not *cryptæ*, but convoluted arteries.—Cells of the kidney,—their figure.—On the manner in which the arteries ramify upon the cells.—On the beginning of the excretory ducts.—Reflections on the secretion of urine.

Liver,—its peculiarities explained, Liver,  
 —cells demonstrated,—origin of the excretory ducts shewn,—observations on secretions in general ;—secretion, a decomposition of the elementary parts of the blood, and a new combination formed *sui generis*,—on the appendages to glands, as the gall bladder, urinary bladder, mucus-follicles, &c.—An inquiry into the different theories of secretion,—on preverted secretions,—on increased



secretions, with an inquiry into their causes. *Note*, The kidney and liver are here, only, adduced as specimens of compound glands, which will, hereafter, be more fully explained, when we treat of each particular subject.

Further reflections on glandular secretion:—Interstitial fluid,—found on all the internal surfaces, and in all cavities of an animal body, for the purpose of lubrication,—an inquiry into its source.—A review of the doctrine of transudation,—proofs that no transudation takes place in the living body,—the experiments, on which this theory is built, are false, and the theory weak.—Proofs that the interstitial fluid is a secretion:—the properties of this fluid differ in different states of health,—in the healthy animal, it will coagulate on exposure to the air,—loses of its coagulability, as the animal becomes weak, and *vice versa*;—properties of this and all other secreted fluids may be changed by an increased or diminished state of action of the vessels.—Reflections on the plastic power of arteries,—proofs that they possess such a power.



power.—An inquiry into the doctrine of inflammation.—On the formation of pus ;—pus, a secretion,—experiments to prove it.—Further observations on absorption,—proofs that lymphatic vessels act as capillary tubes,—the use of villi explained.—How do lymphatics absorb from smooth surfaces?—absorption cannot take place in the dead body.

On the progress of the lymph in the lymphatic vessels,—on the use of their valves,—on their muscular fibres,—on the effects of collateral pressure, &c.

Reflections on scrophula.

### *Of the Structure of Bone.*

Bones, of all parts of the body, on first sight, have least the appearance of organization,—are not mere concretes,—are evidently organized,—have blood vessels entering at all parts,—how demonstrable.—Texture, fibrous,—fibres, longitudinal, or radiated, according to the figure of the bone ;—bones have tranverse fibres, forming lamina or plates,—how separated.

Bone.

—Fi-

——Fibres most conspicuous in growing bones,—evanescent in old age,—old bones appear compact,—fibrous texture may be seen in them, if burnt.

——All bones, more or less hollow,—in cylindrical bones, cavities are large,—are intersected with bony fibres, called cancelli\*,—are filled with fat:—cancelli, most compact in the centre, and more delicate towards the extremities; coarser towards the surface, in the axis, reticular.——Bones are porous,—the pores, how seen,—use, to admit vessels to enter all parts of the bone.—Cavity of the bone larger at its extreme parts.——Why are bones hollow?—not for the lodgement of marrow, but to give greater strength with the same number of fibres;—hence in birds, bone thin, cavity large;—annual plants, as corn, &c. are proofs of this assertion.——Medullary canals explained,—their use, to admit blood vessels.——In flat bones, as those of the skull, the cancellated structure, between the two plates, called diploe.

---

\* Cancelli, lattice-work.

—All bones have arteries, veins, nerves and lymphatic vessels.—Do arteries entering into bones, deposit their coats?—Arteries, their use.—Bone, not sensible in a sound state, but highly so in disease.—Why are bones without feeling?—physical reason, they have but few nerves—final, feeling would have been inconvenient.—Lymphatics absorb,—proofs that they do so.

Marrow, found in the cavities of all bones,—consists of a congeries of cells,—forms a part of the glandula adiposa.—Marrow appears differently in different parts of the same bone:—hence, the division into the medulla and succus medullaris,—this division how far just.—The extremities of cylindrical bones seem more vascular than their centre,—this appearance explained;—flat bones, uniformly vascular.—Cells in which the marrow is lodged, surrounded by plexuses of small blood vessels.—Is marrow sensible?—not acutely so, in the sound state,—very sensible, in disease.—Marrow,—its use,—supposed to prevent brittleness,—not true;—how



—how proved.—Brittleness of bone,  
 —from whence arising.—Marrow  
 said to transude into joints,—not just.  
 —Final use,—it is part of the glandula  
 adiposa, and, as nature provides for a  
 constant and nearly equal supply of  
 nutriment, fat is made, and deposited  
 in the cavities of bones, and other  
 parts, which would otherwise have  
 been unoccupied,—hence, bones were  
 not made hollow to contain fat, but  
 being made hollow to answer other  
 purposes, marrow is deposited in them,  
 —in dropfical habits, where the fat is  
 absorbed from the exteriors and other  
 parts of the body, the marrow is ab-  
 sorbed also.—Marrow, its diseases,  
 —being vascular, is subject to inflam-  
 mation, suppuration, &c.—hence,  
 spina ventosa.—Concussion said to  
 happen,—how far true.

Periof-  
teum.

\* Periosteum, a membrane invest-  
 ing the external surfaces of all the  
 bones of the body, except where they  
 form joints,—structure, of a white,  
 compact, ligamentous, or tendinous

---

\* Periosteum, from περι, *circum*, about, and οσεν,  
 os, a bone.

nature,—more vascular than ligaments,—has vessels for the use of the bone, arteries, veins, nerves, and lymphatic vessels,—consists of different layers,—external, are adventitious, being expansions of the tendons and ligaments inserted into the substance of the bone,—hence thicker near the insertions of large tendons and ligaments.—Periosteum, said to make a general covering to the skeleton,—this idea not perfectly just.—Are the internal cavities of bones covered by periosteum?—it may be demonstrated in some bones, and, probably, exists in all.—This called internal periosteum.—Periosteum, its use,—gives a smoothness to the bone, lessening friction with the soft parts,—allows of blood vessels to be divided into small branches, which enter all parts of the bone,—strengthens the connection between the epiphysis and body of the bone,—gives a more commodious attachment to muscles, &c.—An inquiry into the other uses that the periosteum has been said to have.—In the filken fowl, from the Coast of Guinea, periosteum,



black.—Diseases,—inflammation and its consequences,—periosteum suppurates unkindly,—floughs,—affects the bone, in consequence,—matter formed between it and the surface of the bone,—venereal poison readily affects it,—forms nodes.—Colour of bone: in prepared bones, colour different, from a great variety of causes,—in fresh bones, different, from age,—young bones redder, having more vessels in proportion to the cretaceous matter,—different in different parts of the same bone,—colour altered by animals feeding on madder.

Chemical  
Analysis.

Chemical analysis,—bones yield the same elements as all other animal substances,—earth in different proportion, in different bones,—proportion, about  $\frac{5}{9}$ .—If the caput mortuum is burnt in a close vessel, it gives ivory black,—if in an open one, leaves a pure virgin earth, free of salt,—hence used in making cupils.—Earth, not only of bone, but of all other parts of the body, when the other principles are destroyed, still retains a slight degree of adhesion: hence skeletons,  
found



found in vaults, appear perfect, but moulder away on being touched, or exposed to the air.

Cartilages,—white, elastic substances,—of three different classes,—those of the 1st supply the place of bone in the adult, as in the ear, nose, larynx, trachea, &c.—their advantages.—Those of the 2d. supply the place of bone, in the early part of life, 'till bone can be formed.—Those of the 3d, form the articular cartilages, or those crusts which cover the ends of bones, where they form joints, to make motion easy, and prevent abrasion.—Cartilages covered by a kind of periosteum, called \*perichondrium.

Cartilage.

Structure of the different classes, different.—Those of the 1st class, covered by a ligamentous membrane, similar to the periosteum,—have blood vessels;—these small and not numerous;—have also nerves,—are little sensible,—not subject to disease,—

---

\* Perichondrium, from *περι*, *circum*, about, and *χονδρος*, *cartilago*, a cartilage.

bear pressure better than other parts.

—Those of the 2d class, covered by that periosteum which, afterwards, invests the bone,—are very vascular, admitting arteries, veins and lymphatic vessels, that, afterwards, exist in the bone,—serve as a nidus for the bony fibres to shoot in. —Those of the 3d class, very elastic,—compact,—have no vessels that can be demonstrated; yet, probably, are not inorganic,—have fibres that may be separated by maceration,—not sensible,—have no pericondrium,—use, to give smooth surfaces,—to prevent abrasion and break off the force of collision,—are not subject to disease,—but, may be destroyed by diseases in the neighbourhood,—do not pullulate,—become black and slough by exposure to the air,—do not exfoliate like bone,—how separated from sound parts.

Liga-  
ments.

Ligaments are to bones, what tendons are to muscles; —structure explained; —are but little sensible.

Capfular  
Ligam.

Capfular Ligament,—a connecting medium between two bones, making



a sort of purse, or bag, containing the \*synovia of the joint.

Structure of the ligamentous kind, —consists of two layres, different in their nature and origin,—these distinguished by the epithets, external and internal,—the external one consists of the ligaments, which tie the bone together, and seems to be continued into the periosteum;—the internal, is a smooth, delicate, thin, dense, reflected membrane, extremely avascular,—can be traced to the edges of the articular cartilages, but, probably, is not continued over them. —Use,—the external, gives strength, and prevents luxation,—the internal, secretes the synovia for the lubrication of the joints.——An inquiry into the injuries the capsular ligament sustains from luxations.

Luxations arise from a variety of causes, as external violence, relaxation of the ligaments, &c,—proved from dissections.

---

\* Synovia, a term given by Paracelsus to the fluid contained in the joints.



Synovial  
Glands.

Synovial Gland,—a term improperly applied to a fatty substance found in most joints of the body;—its office supposed to secrete synovia.—An inquiry into the opinion of Havers on this subject:—is not a synovial gland.—An inquiry into the manner in which synovia is really secreted.—Observations on the properties of synovia, and the morbid changes produced on it.

Classes of  
Bones.

Bones, from their configuration are divided into four classes, the 1<sup>st</sup> consisting of flat bones, as those of the skull, compact on both sides and spongy within.—The 2<sup>d</sup>, of spherical, or of such as approach towards that figure, as the bones of the carpus, tarsus, &c. having a thin bony plate, externally, being spongy or cancellated, internally.—The 3<sup>d</sup>, consists of irregular bones, as the vertebrae.—The 4<sup>th</sup>, of oblong cylindrical bones, as those of the extremities: these have large cavities.—their ends being enlarged make the joints stronger, remove the muscles further from the centre of motion,

tion, and, thereby, give their tendons a more advantageous attachment, whilst the middle being small, gives a convenient lodgement to the bellies of muscles.

Bones have eminences of different kinds, distinguished by the following names; \*head,—†condyle,—‡tuberosity,—§corona,—||spine,—¶supercilium,—\*\*labrum, &c.—these terms explained.—Bones have processes to give necessary shape for articulation, and for muscular attachment, some of them being levers; also, for giving advantageous insertions to muscles,—are variously formed, and distinguished by proper names.—Processes are

\* Head, a round process with a neck, always denoting the upper extremity of the bone.

† Condyle, *κονδυλῶς*, properly applied to the joints of the finger; signifies also, an oblong process from the fore to the back part of the bone, used in that kind of articulation called ginglymus.

‡ Tuberosity, a rough, knotty eminence.

§ Corona, a sharp, thin process, also called crist, or spine.

|| Spine, from *spina*, a thorn, a long, sharp process.

¶ Supercilium, a brow.

\*\* Labrum, a lip.

are



are \*apophysis and †epiphysis;—these terms explained.

Cavities. || Cavities are of two kinds, viz. for articulation, and for giving lodgement to soft parts, as ‡cotyle,—§acetabulum, —||glene, —¶alveoli, —\*\*fossa,—groove,—sinus,—sinuosity,—hole,—canal,—furrow;—these explained.

The combination of bones consists of articulation and connection.—— Articulation means the forms of the parts to come in contact, and the relation they bear to one another.—— Connection means the binding by some other substance.

\* Apophysis, from *αποφύω*, *produco*, a process growing out from the surface of the bone.

† Epiphysis, from *ἐπιφύω*, *acresco*, to grow to, a distinct ossification in the young animal, which, afterwards, growing to the body of the bone to which it belongs, makes it perfect.

‡ Cotyle, from *κοτυλη*, a cup, a round, deep cavity.

§ Acetabulum, the same.

|| Glene, from *γληνη*, properly signifies the socket of the eye; but is also used to express a shallow cavity in bone, as cotyle does a deep one.

¶ Alveoli, the sockets in which the teeth are placed

\*\* Fossa, properly a ditch, a deep cavity between two bones.



Galen's division into, 1st, Arthron	{	*Diarthrosis.	{	†Enarthrosis.
				‡Arthrodia.
				§Ginglymus.
	{	Synarthrosis.	¶	Sutura.
**			Harmonia.	
††			Gomphosis.	

2nd, ††Symphysis.	{	§§Synneurosis.
		Synchondrosis.
		¶¶Syssarcosis.

\* Diarthrosis, from *δια*, *cum*, with, and *αρθρον*, *membrum*, signifies that kind of articulation which gives to the joints considerable motion.

† Enarthrosis, from *εν* and *αρθρον*, is applied to joints having motion in all directions, as the joints of the humerus, &c.

‡ Arthrodia, the same as enarthrosis.

§ Ginglymus, from *γινγλυμος*, *cardo portæ*, the hinge of a door; admitting of flexion and extension, only, in one direction.

|| Synarthrosis, from *συν* and *αρθρον*, a species of articulation that has no manifest motion.

¶ Sutura, a seam, the articulation of the bones of the head.

\*\* Harmonia, *concentus*, harmony; where the surfaces of the two bones so exactly correspond with each other, that they leave no intermediate space.

†† Gomphosis, from *γυμφος*, *clavus*, a nail; where the bone is driven in, like a nail, as the teeth in the jaw-bone.

‡‡ Symphysis, or synthesis, from *συντιθημι*, *compono*, the binding of joints.

§§ Synneurosis, from *συν*, *cum*, and *νευρον*, *nervus*, connection of bones by ligaments, which were by the Greeks called nerves.

|||| Synchondrosis, from *συν* and *χονδρος*, *cartilago*, a cartilage; the union of bones by cartilage, as of the epiphyses to the bodies of the bones.

¶¶ Syssarcosis, from *συν*, and *σαρξ*, *caro*, flesh; the union of bone by muscle only, as the scapula of the quadruped; but, in the human body, we have no instance of this species of articulation.

*Note,* Great firmness in joints, and great extent of motion, are incompatible, and therefore, one of them is generally found to be procured at the expence of the other; for example, arthrodia, is weak; ginglymus, strong.

Observations on the diseases of joints, particularly on \*luxations and †subluxations.—An inquiry into the different causes producing ‡anchylosis.

### *On the Formation of Bone.*

All bones formed in cartilage;—consist of fibres, which branch differently in different bones.—§ Ossification first takes place in the centre.—In flat bones, fibres are radiated,—in cylindric, shoot towards the extremities,—in spherical, quaque vèr-

\* Luxation, from *luxo*, to disjoint.

† Subluxation, a partial dislocation.

‡ Anchylosis, from *ανχυλος*, *curvus*, crooked, the stiffness of the joints, a disease, where the bones growing into each other, the motion of the joint is lost.

§ Ossification, from *os*, bone, and *facio*, to make, the formation of bone.



sum,—form lamellæ.—First appearance of ossification explained.—An inquiry into the growth of bones.—An examination of the two principal theories, invented by Du Hamel and Havers, to explain the growth of bones.

Bone,—a new formed substance,—consists of earth and gluten,—at first, solid without cancelli,—the appearance of cancelli when first distinguishable,—earth of bone, not permanent,—constantly changing, during the growth of the animal.—Observations on the feeding of animals with madder, in the different periods of their existence.—On the changes produced on bone, by acids, alkalies, &c.—The generality of bones not completely formed, 'till the age of puberty:—hence the use of epiphyses.—Some bones perfectly formed, at or before the time of birth, as the *os-ficula auditus*.

Observations on the re-union of bones.—An account of the success of several experiments made on the broken bones of animals, with re-

Callus.

marks on the manner in which \*cal-  
lus is formed, to which will be added  
some practical observations on the  
treatment of fractures in general.

---

\* Callus, a new formed substance, secreted for  
the purpose of uniting broken bones.

*End of the First Section.*

Section



---

## Section the Second.

### On O S T E O L O G Y.

---

#### *Of the Spine.*

**A**N introduction to the study of \*osteology.—A general description of the skeleton.—Skeletons are of two kinds, natural and artificial;—natural, what;—artificial, the most useful to students.—Mounting, or the art of articulating skeletons, discovered in the 16th century.—Skeleton not self-poised, in the living body;—from structure and situation, requires something to keep it erect.

Skeleton, commonly, divided into head, trunk, and extremities.—Trunk and extremities are a better

---

\* Osteologia, from οστέον, os, a bone, and λεγω, narro, to describe, a description of the bones.

division,

division.—Trunk should be first understood :—division into neck, chest, loins and pelvis.—Chest and pelvis have bone, all round ;—in the neck and loins, the only bone is the spine.

\*Spine, being the basis of the trunk, should be first studied,—is the pillar of support,—straight in a front and back view,—in a profile, is bended in different directions,—is formed of two pyramids joined at their bases,—is made by the juncture of a number of bones, called vertebræ. —†Vertebræ, divided into two classes, true and false.—True vertebræ, twenty-four in number,—these form the upper pyramid, the seven superior of which, forming the neck,

---

\* Spine, from *spina*, a thorn, so called on account of its processes representing thorns. *Παχὺς. spina dorsi.* *νωτός. dorsum. tergum.* *Ἀκανθα, spina*, a thorn; perhaps from *ακμή, cuspis*, a point. *ἱερὰ σφυγξ, from ἱερός, sacer, and σφυγξ, fistula. σωλήν, canalis, tubus. hominis carina. antisternon, from ἀντί, contra, and στῆθον, pectus.*

† Vertebra, by the Greeks, *σπονδυλός, spondylus*, a joint of the spine.—*σφυγξ. cardo. ossa vertebrata. verticula.*



are called \*cervical,—the next twelve, making the back, are called †dorsal,—the five inferior, the loins, are called ‡lumbar.

The vertebræ of the neck have, nearly, a perpendicular bearing,—those of the back, are curved from the fore to the back part; whilst those of the loins are made to project, from the back to the fore part; the whole resembling the form of an italic *f*.—Incurvations of the spine,—their use.—Of the spine the use is threefold, 1st, to support weight,—2dly, for muscular attachment,—3dly, to give lodgement to soft parts.

The true vertebræ correspond with each other in their general characters, though each class be distinguished by particular marks:—each vertebra has a body forming the fore part, and rounded from side to side,—has flat surfaces, above and below,—hard edges:—is spongy within,—has holes for blood vessels, &c.—posterior and

---

‡ Cervical, from *cervix*, belonging to the neck.

† Dorsal, from *dorsum*, the back.

‡ Lumbar, from *lumbi*, the loins.

lateral parts formed by processes make a ring.—Processes are, spinal or \*azygos, on the back part;—on the sides, a pair of transverse or lateral;—these give convenient attachment to muscles.

On the upper part, a pair of oblique or articulating processes,—on the under part, a second pair of oblique processes for articulation:—substance of the processes harder than the body of the bone,—under each transverse process, is a notch,—when two vertebræ are joined, this notch forms a hole:—use, to admit nerves to pass through.—The roots of the spinal processes are rough, for the insertion of elastic ligaments.—The holes behind the bodies of the vertebræ, made by the ring of processes on the back part, are so opposed to each other, that they form a canal, in which the spinal marrow is lodged.

Cervical Vertebræ,—their general character,—bodies are flat, not pro-

\* Azygos, from α, and ζυγος, *jugum*, a yoke; without a fellow



jecting,—hollowed from side to side, on the upper part,—rounded from side to side, below,—mutually receiving and being received.—The hole for the spinal marrow, triangular,—the angle, behind ;—spinal processes are short,—in general, bifid ;—transverse processes, short,—are perforated to admit the vertebral artery to pass up to the brain.—Articulating processes, very oblique,—are covered by articular cartilages,—have capsular ligaments, and form joints ;——the first, second and seventh differ from the rest.—Second vertebra, called *dentata*,—body flat, on the fore part,—spinal process very strong, bifid, marked by the insertion of muscles.—Transverse processes, short and small.—Superior articulating processes, broad, strong, and nearly horizontal.—Inferior articulating processes, more oblique.—From the upper part of the body rises a strong, tooth-like process called *odontoid*, \*marked by the attachment of strong liga-

---

\* *Odontoid*, from *οδοντος*, *dens*, a tooth, and *ειδος*, *forma*, shape ; resembling a tooth.



ments ;—this vertebra formed of four ossifications.——†Atlas, differs from the general character,—is a mere ring of bone,—body wanting,—transverse processes long and perforated ;—has no spinal process,—is broad from side to side ;—hole, round,—printed strongly by ligaments, which pass between it and the toothlike process of the dentata.——Tooth-like process of the dentata tied, strongly, to the fore part of the atlas, within its bony ring,—this ring has a smooth surface, on which the process plays.——The arch of the atlas revolves round the odontoid process, which forms a centre of revolution.——The oblique processes above, are excavated, forming glenoid cavities, into which the condyles of the os occipitis are received.——The inferior oblique processes, broad and strong, corresponding with those of the dentata.

---

† Atlas, from *τλάμι*, *fero*, to bear ; supporting the head, as the fabulous Atlas was supposed to support the world ; *epistrophia*, from *επι*, *super*, upon, and *στροφή*, *verto*, to turn ; *αστραγαλος*, *vertebra*, *spendylus*.

The rotary motion of the head is produced by a revolution of the atlas round the dentata.—The seventh vertebra, very like the dorsal,—spinal process long,—differs from the spinal processes of the dorsal, in being rounded at its extremity :—this is of use in determining muscular attachment.—The other vertebræ colli have nothing particular, except the spinal processes and bodies becoming larger as they descend.

Vertebræ Dorfi have their spinal processes long and drooping one over the other,—have three edges.—The length of the spinal processes encreases from the first to the eighth or ninth, and, then, decreases to the last.—Transverse processes, are very long, smooth, strong, and, a little, reclined ;—the extreme point has a smooth surface, covered by cartilage, for the articulation of the tubercles of the rib.—Articulating processes, nearly perpendicular ;—bodies, project considerably,—are thicker from the fore to the back part,—printed by the heads of the ribs,—on each side, have two smooth surfaces,

Vertebræ  
Dorfi.

covered by cartilage, for the articulation of the head of the rib ;——the head of the rib being received between the bodies of two vertebræ, each vertebra is imprinted, at its upper and lower edge, by two ribs on each side ;——the hole for the spinal marrow is smaller in the back than in the neck or loins.——The first and two last vertebræ differ from the others :——the first receives the head of the first rib entirely, and part of the second ;——the two last, have, each, one impression for one rib,——their transverse processes short, and without surfaces for articulation with the rib.

**Lumbar  
Vertebræ.**

Lumbar Vertebræ, bodies large,——broader from side to side,——hole, large.——Spinal process large, broad and strong,——placed nearly horizontal and not drooping, like those of the back.——Transverse processes long, but not strong,——middle one, the longest.——Articular processes, horizontal,——articulation of the last vertebra with the sacrum, the same as between each vertebra.——The bodies of the vertebræ make the pillar of support, which comes near the centre of the trunk ;



trunk ;——the processes give convenient attachment to muscles ;——the canal, formed by the holes in the vertebræ, contains the spinal marrow, from which nerves go off to the different parts of the body.——The vertebræ are strongly connected to each other by the intervertebral substance, which is of different thickness between the bodies of different vertebræ, being thicker below, and gradually becoming thinner as we ascend.——Anatomists are at a loss, what to call it, some giving it the name of gristle, others of ligament, others of gristly ligament ;——is ligamentous, principally.——The superior and inferior surfaces of each vertebra, have thin, cartilaginous crusts, to which the ligamentous fibres are attached,——these fibres are disposed in concentric layres, which decussate each other,—are oblique, passing from the bone above to that below,—are softer towards the centre, where they have somewhat the appearance of soft cartilage.—No incompressible drop.—The fluid said to be formed here, the effect

effect of putrefaction.—The inter-vertebral substance being very elastic, serves not only to attach the bodies of the vertebræ firmly to each other, but, also, assists in keeping the body erect.—Articular processes have cartilaginous surfaces, capsular ligaments, synovia, &c.—The bodies of the vertebræ are covered by a strong tendinous periosteum,—Reflections on the use of the elastic ligaments, at the roots of the spinal processes.

Motion of  
the spine.

Spine may be bended, considerably, forwards and backwards ;—laterally, very little :—Rotation principally brought out, between the atlas and the dentata ;—flexion and extension of the spine, less than is generally imagined, the bones of the pelvis moving on the thigh bones.—Vertebræ of the neck most moveable, tho' the motion of any one joint be very inconsiderable.—Reflections on the spine.—The spine, being the basis of support for the trunk, required strength and a considerable degree of motion ;—both of these are admirably brought out by its mechanism, the  
spine

spine being built according to the rules of architecture :——Its shape, pyramidal, of all others the fittest for support.——Why such a number of vertebræ?——Why twentythree joints?——Is it to prevent the great angle, that would be formed between any two bones?——Is it to prevent the medulla from being compressed?——these the common opinions.——The true reason is, great strength was necessary here, but great motion is incompatible with great strength in the same joint,—if all the motion had been in one joint, that joint must have been, in proportion, weaker :——For this reason, a number of joints is given, each allowing of a small degree of motion, whilst they possess considerable strength ; the sum of the motions of all of them being sufficient to answer the purposes required, without diminishing the stability of the trunk.——Centre of gravity of the body, rather before the spine;—hence, strong muscles necessary on the back part.——The extensors are very numerous, and the more so, because  
the



the lever, with which they act, is short:—The flexors act with a longer lever, as the rectus abdominis, —in strong efforts, the flexors act; but easy flexion is rather performed by the relaxation of the extensors allowing the body to gravitate forwards. —Remarks on incurvations of the spine,—spine naturally straight, in a fore and back view, yet, frequently, by disease becomes crooked;—several \*hypotheses have been formed to explain its cause, by †Dr. Mayow, ‡Glisson, §Havers, ||Du Hamel, ¶Monro, \*\*Leviani, and others:—The true cause seems to be, that in rickety constitutions, the bones lose

\* Hypothesis, from υποτιθημι, *suppono*, to suppose.

† Mayow (John) M. D. *de Rachitide*, 1668.

‡ Glisson, a very eminent English physician, *de Rachitide, sive morbo puerili, qui vulgo, the rickets, dicitur*. Lond. 1650.

§ Havers (Clopton) M. D. *osteologia nova*. Lond. 2nd edit. 1729.

|| Du Hamel (Jean Baptiste) an eminent French philosopher and divine.

¶ Monro (Alexander) sen. M. D. *The anatomy of human bones*.

\*\* Leviani, an Italian author.

that firmness, they naturally possessed, and, becoming soft, bend under the weight of the body; hence, those bones that bear weight, as those of the legs, thighs, pelvis and spine, may be considerably bended, whilst the arms, which bear no weight, remain straight.—An inquiry into the cause of the \**mollities ossium*.—An inquiry into the cause of rickets: —the symptoms and method of cure explained.—Rickets spoken of by Hippocrates and Galen, under the name of *tabes infantium*:—first appeared in England about the year 1620; †probably, existed before that time.—An inquiry into the causes of deformities of the spine and methods of cure.

‡Pelvis,—its general shape, when standing on a table,—sides highest,—ridge, called brim of the pelvis, divides it into two parts: all that is

Pelvis.

---

\* *Mollities ossium*, softness of bone.

† Reusnerus, in his book published at Basil, 1582, speaks of *tabes* as common in Holland, and of Nuletia, having crooked legs.

‡ Pelvis, *πελvis*, a basin.

above the ridge, is the lower part of the cavity of the abdomen; all, below the ridge or brim, is properly the cavity of the pelvis.—Its figure irregular, and not beautiful, unless we have an eye to its use,——Why this part of the body, formed by a circle of bone.——The trunk might have been supported otherwise; yet, being in a circle, greater firmness is allowed of, with the same quantity of bony matter; and this being the centre of motion of the body, great firmness was requisite.——Necessary that muscles should have an attachment for motion, in all directions,—its form, also, necessary for the expulsion of the foetus, urine and fæces,—its \*axis does not coincide with the axis of the trunk;—trunk is supported on the thigh bones,—for this reason, the axis is so altered, that the upper part of the sacrum is in a line with the heads of the thigh bones, and the trunk has

---

\* Axis, that quiescent right line of a vessel, which is always equidistant from the sides; or the line, real or imaginary, that passes through any thing, on which it may revolve.



a perpendicular bearing on them.—

The pelvis, placed on a table, differs, in the direction of its axis, from that of its natural situation,—so, in describing the contents, regard should be paid to this circumstance.—Observations on the axis of the pelvis.—

Pelvis, in a lower view, has three projecting parts and three notches,—these, in the fresh subject, formed into two holes by the sacro-sciatic ligaments,—behind, are suited to the spine,—above, to respiration,—below, to the parts of generation.—Pelvis, in the adult, consists of four bones, os sacrum, os coccygis, and two ossa innominata.

\* Os sacrum,—is triangular, in a fore and back view,—is concave, before, for the purpose of enlarging the cavity of the pelvis,—is convex, behind:—to its angular point, is attached the coccyx, which is directly downwards.—Sacrum consists of five bones, called †false vertebræ,—the bodies

Os Sacrum.

---

\* Os Sacrum, *Ιερον. σπονδυλος μεγας*, Hippocrates. *υποσπονδυλον, πλατυ, latum. os clunium, clavium.*

† Vertebræ, *νοθαε.*

and transverse processes are ankylosed to each other, so as to restrain all motion;—these bones are separable, in the early part of life,—form a pyramid, the base of which is joined to the last vertebra of the loins,—the upper part, or first bone of the sacrum, has two articular processes, and a flat surface on its body, for articulation with the last vertebra lumborum;—has a canal, in which the lower part of the spinal marrow is lodged.—— Spinal processes of the three or four first vertebræ, uniting with each other, form a bridge of bone covering the back part of the canal,—from thence to the coccyx, the spinal processes are wanting, and the lower part of the spinal marrow is covered, only, by a strong ligamentous membrane.—— Sacrum has four pairs of holes, on the fore and back part,—through the posterior holes, pass very small nervous twigs,—through the anterior, pass the four superior pairs of sacral nerves,—on each side of the sacrum, is a rough irregular surface, forming a pair of shoulders to the bone.——

Sacrum,

Sacrum, thick above, thin below,—irregular, for muscular attachment, on the back part.

\*Os Coccygis follows the sweep of the sacrum,—consists of four bones,—terminates about an inch from the anus :——first bone is broad, above, narrow, below,—has two lateral processes, making a notch for the fifth sacral nerve, and, sometimes, forming a hole,—hence five holes in the sacrum,—has two posterior processes,—no cavity.—second bone, broad, above, narrow, below,—has two lateral processes, but no posterior ones :——third and fourth bones are anchylosed.——Sometimes, all the bones of the coccyx are anchylosed to the sacrum.——Reflections on the peculiarities of these bones.——Supernumerary bones not common.——Os coccygis, said to support the rectum ;—not true.—therefore, *procedentia ani* not produced by weakness in this bone.——Os coccygis, by being anchylosed to

Os Coccygis.

---

\* Os Coccygis, gen. of *coccyx*, rump-bone, *οἰστρον*, *ultima pars spinæ*.—*οἰστρον*. *spondylium*. *os cuculi*, from its supposed resemblance to a cuckow's beak.



the sacrum, said to be, sometimes, the cause of difficult labour.——The elongation of this bone makes the tail of the quadruped.

Os Inno-  
minatum.

\*Os Innominatum,—of a flat, irregular figure,—broad, at the upper part,—consists of three ossifications in the young subject, to which particular names have been given, *viz.* †ilium, ischium and pubis,—these unite to form the acetabulum.——The terms are kept up to express the different regions of this bone, in the adult;—the parts specified:——internal and external surfaces of the ilium covered by muscles;—spine of the ilium, what;—anterior superior, and anterior inferior spinous processes, —posterior superior and posterior inferior spinous processes shewn.——Bony brim of the pelvis how formed; —Surface for articulation with the sacrum.——Sacro-sciatic ligaments, what.——Of the figure and extent of

---

\* Offa Innominata, Σκελεων. προσφυσας. *sacro conjuncta.*

† Ilium, gen. plur. of *ilia.*——Δαγων. κενεων; *scaphium lumbare. clunium. clavium. anchas.*

the \*os pubis.—Of the symphysis pubis.—The situation and extent of the ischium.—Spinous process of the †ischium.—Acetabulum, how formed ;—its use.—On the attachment of the crus penis in the male, and of the crus clytoridis in the female.—An account of the muscles attached to this bone, with reflections on their uses.—Reflections on the difference between male and female skeletons :—these differ most, in the formation of the pelvis ;—the pelvis of the female more capacious than that of the male ;—processes, at the under part, at a greater distance.—A comparative view of the male and female pelvis.—An enquiry into the cause of the deformities in this part ;—deformed pelvises the most frequent cause of difficult births.—Pelvis, sometimes, found perfect, where the spine has been much bent.

‡Thorax,—its shape, different in different people ;—in general, in well

Os Pubis.

Ischium.

---

\* Os Pubis, share bone ; H<sup>β</sup>n. *os pectinis. penis. pudibundum. fenestratum.*

† Ischium, hip bone. *os coxæ, coxendicis. pixis.*

‡ Thorax, *ῥαχίς*, the breast or chest.

formed persons, broader from side to side;—in some decrepid people, widest from the fore to the back part:—the bodies of the vertebræ projecting, divide it into two lateral cavities.——Lungs extend behind the spine, because the pillar of support being brought nearer to the centre of the body, the chest is less deep anteriorly than laterally.——Thorax in the fresh subject, not so large, as it appears to be, on viewing the skeleton.——The general figure of the thorax conoid,——the apex of the cone at the upper part.

Thorax, consists of twelve ribs, on each side; of the spine, on its back part, the sternum and zyphoid cartilage on the fore part, and of the cartilaginous appendages of the ribs by which they are attached to the sternum.

Ribs. \*Ribs divided into two classes, true and false:——seven superior on each side, called true ribs.—five inferior, false.——Ribs have many things in common,——are curved,——extend

---

\* Ribs, *costæ*, πλευρας. περιστεγνα. σκαδας.



round, but not quite one half of the body,—are placed obliquely ;—each rib has a head, or posterior extremity, —has two impressions made by the two bodies of the vertebræ, to which it is attached,—is covered by articular cartilage,—capsular ligament attached round its neck ;—Tubercle at a small distance from the head of the rib,—has two surfaces, the superior for the attachment of a ligament,—the inferior, covered by articular cartilage, forms a joint with the extreme point of the transverse process of the vertebra.—Angle of the rib, where most bent, forms the posterior part of the chest.—Rib, near the head, rounded,—flattened as it approaches the sternum,—breadth increases,—sides smooth,—edges sharp,—lower edge grooved,—groove becomes shallower towards the anterior extremity.—Anterior extremity, called sternal, is not continued on to the sternum,—but is articulated thereto by a cartilage.—Sternal extremity hollowed, like a cup, in which the cartilage is received.—Curve, not truly *Curve*  
K. ———— semi-

femicircular,—most bent at the angle,—each rib, as it were, twisted, consisting of two curves not on the same plane.

Carti-  
lages.

Cartilages,—the three superior, nearly straight,—the fourth turns, making an angle with the body of the bone,—this angle increases to the eighth, which is nearly a right one, and then decreases.—Obliquity of the ribs to the spine increases, from the first to the last.—The intercostal space increases from the posterior to the anterior extremity, like the sticks of a fan.—The distance between the angle and head increases as we descend :—in the first rib, the angle and tubercle coincide.—The distance of the bony anterior extremity, from the middle line of the body, increases, excepting the second rib.—Angle between the rib and cartilage to the eighth rib, becomes more acute, then decreases,—the length of the rib increases to the eighth, then decreases :—this is true of rib alone, cartilage alone, or rib and cartilage together.—Crookedness decreases as we descend, the last being almost straight



straight.—The furrow more remarkable to the eighth, then evidently becoming less.—Motion increases from the first rib to the last.

First rib, nearly horizontal,—one side is opposed to the cavity of the chest,—the upper side marked by the attachment of muscles, and by the blood vessels, which pass from the chest to the arm;—head, smooth and regular;—angle and tubercle, coincide.

Specialities,

Second rib, strongly printed by the attachment of the serratus major anticus.—Reflections on the diseases of the ribs:—in deformed chests, ribs grow crooked, not from their supporting weight, but from the spine giving way:—hence, deformities of the chest, arising from crookedness of the spine, may increase.—The hump-back made by the ribs, and not the spine.—Observations on the angular hump;—if from an original mal-conformation, does not generally become worse;—sometimes arises from the bodies of the vertebræ being destroyed by matter or pressure,—this generally fatal.—Ribs how affected in rickety constitutions.—By fractured ribs



sometimes the lungs are wounded,—this may occasion spitting of blood, empyema, &c.—Callus flattened by the motion of the lungs may fill up the intercostal space, and hence become an obstacle in doing the operation of the \*empyema.

Sternum. †Sternum makes the fore part of the thorax,—its general shape, oblong,—flat on the fore and back part,—posterior flat side turned towards the thorax;—the exact form undetermined,—different in different subjects;—situation oblique with respect to the spine,—is near the spine at the upper part, at a greater distance below,—consists of three bones,—these specified,—are frequently anchylosed,—on its sides, receives the cartilages of the six superior ribs,—at the upper part are surfaces for articulation with the clavicles,—to its lower part is attached the xephoid cartilage.

\* Empyema, a collection of matter in the thorax, from *ev*, *intus*, and *πυον*, *pus*.

† Sternum, *Στεγνον*, the breast bone, *os pectoris*.

\*Xephoid

\*Xephoid Cartilage,—frequently bony in old people,—in young subjects, loose and moveable,—in old age, its motion lost,—shape varies in almost every subject,—sometimes perforated,—sometimes forked at its extremity.—Reflections on the use of this part,—on its diseases.—Observations on the motion of the ribs and sternum.—An inquiry into the manner in which respiration is carried on, with reflections on some of the diseases of the chest, as rickets, softness of bone, fractures, distortions of the chest, pleuresy, &c.

Xephoid  
Cartilage

Upper Extremity, divided into shoulder or humerus, arm, fore-arm or cubitus, and hand.

Upper  
extremity

Shoulder consists of scapula and clavicle.

†Scapula,—formed of three ossifications,—situated on the side of the chest, to which it is attached by mus-

Scapula.

---

\* Cartilago Xiphoides, from *ἐπίφος*, *ensis*, a sword, and *εἶδος*, *forma*, shape: also called cartilago ensiformis.

† Scapula, from *σκαπῆ*, *cavo*, the shoulder blade, *homoplata*, *ωμοπλατα*.



cles,—is very moveable,—its position varies in the action of the arm, being raised, depressed, brought backwards, forwards, &c.

Shape. Shape, triangular,—divided into internal and external surfaces,—external, irregular,—internal, more smooth and regular;—angles,—one looks forward and has a glenoid cavity, for the purpose of articulation with the os brachii,—this called its head,—resembles a head in nothing except having a neck;—the other two angles distinguished by the terms superior and inferior;—sides of the triangle, unequal,—upper side, called *costa superior* shortest,—on the forepart a process hangs over the surface, for the purpose of articulation;—the inferior looks forwards, downwards and upwards,—this called *costa inferior*;—posterior side looks backwards,—called *basis of the scapula*,—internal surface hollowed,—has three or four lines made by the tendons of the *sub-scapularis*;—external surface divided into two regions, by a process called *spinal*,—extreme part  
of



of the process projects over the head of the scapula,—is called Processus \*Acromion,——surfaces for articulation with the clavicle, shewn.—†Processus Coracoides, what?——Scapula is everywhere strongly marked by muscular attachment,—the more minute subdivisions of this bone explained, and the attachments of particular muscles pointed out.—Reflections on the surfaces for articulation with the head of the os brachii.

†Clavicle,—its general form that of an Italic *f*,—situated between the sternum and scapula. Clavicle.

The Scapular Extremity generally highest,—can seldom be depressed lower than the horizontal line,—its two extremities distinguished by the epithets, sternal and scapular.—Sternal extremity is triangular, unequal and irregular;——between it

\* Acromion, from *ακρῶς*, *summus*, the top, and *ὤμων*, *humerus*, the shoulder.

† Coracoides, from *κόραξ*, *corvus*, a crow, and *εἶδος*, *forma*, shape.

‡ Clavicle, from *clavis*, a key, from its supposed resemblance to the keys of the antients.

and the sternum is placed an intervening cartilage, which is loose in the joint, between the cartilages that cover the surfaces of the bones ;—— on the under side, are rough surfaces made by ligaments, which pass from clavicle, to clavicle ;—here, also, is a scabrous surface, made by the attachment of a ligament, going to the first rib, to which the clavicle is strongly tied ;——the body of the bone is rounded on the fore part,—concave behind, and strongly printed by the attachment of muscles.

On the concave part is placed the medullary canal.—Scapular extremity is large, broad and flat,—the posterior and anterior edges, are printed by muscles,—its extreme point is covered by articulating cartilage, and forms a joint with the processus acromion scapulæ ;—the under side is strongly printed by ligaments passing from it to the processus coracoides scapulæ,—the inferior surface forms a bridge for the supra-spinatus.—Clavicle formed of one ossification, which is completed before the time of birth, that pressure might not affect the sub-clavian



vian vessels.—Scapula,—its use, to give greater variety and extent of motion to the upper extremity.—Clavicle,—its use, to keep the scapula at a distance from the trunk, and to give greater extent of lateral motion.——Reflections on the connections and motions of these bones, in the different positions of the limb.

\*Os Brachii, is cylindrical, though Osbrachii irregularly so,—consists of a head or upper extremity, a body, and a lower extremity,—head is rounded,—is not placed at the end of the bone, but obliquely; so that its axis does not coincide with that of the body of the bone,—is covered by articular cartilage,—is adapted to the glenoid cavity of the scapula,—has a short neck to which the capsular ligament is attached;—on the fore part are two tubercles, printed by the insertion of muscles,—between the tubercles is a groove, in which is lodged the tendon of the long head of the biceps muscle,

---

\* Os Brachii, the bone of the arm; frequently, but improperly, called os humeri.



the body at its upper part is cylindrical, at its lower part flattened and drawn out into two rough edges, which lead to the condyles.—Condyles forming the lower extremity of the bone, are two rough tuberosities, for the attachment of muscles and ligaments,—the inner, the longer.—The surface for articulation with the bones of the fore-arm, with respect to the os brachii, is oblique,—from side to side, it consists of three eminences and two cavities, hence plainly ginglymoid,—the internal cavity, with two of the ridges, forms a surface for articulation with the ulna, called \*trochlea,—the other ridge is rounded, and on it the head of the radius rotates.—On the fore part of the surface for articulation is a cavity, into which the coronoid process of the ulna is received, in the flexion of the fore arm.—On the back part, is a cavity for the reception of the olecranon, in the extension of the fore arm :—in this part the

---

\* Trochlea, from τροχίλις, a pulley.

bone is generally \*diaphanous, and sometimes worn through.——Os brachii formed by three ossifications, the extremities being epiphyfes.——Observations on the motions of the os brachii, with reflections on the manner of distinguishing, and treating fractures and luxations of the shoulder and arm.

Fore-arm consists of two bones, radius and ulna.——Radius shorter,——  
not placed in a line with the os brachii.——Radius is external in supination,——in pronation, partly so.——  
†Ulna is prismatical,——at its upper part triangular, at the lower part rounded and small;——its upper extremity has two processes, between which is the surface for articulation with the os brachii, called the ‡Sigmoid Cavity, adapted to the trochlea;——the larger process is placed in the axis of

Fore-Arm.

Ulna.

---

\* Diaphanous, from *δια*, *per*, and *φαίω*, *appareo*, transparent.

† Ulna, from *ωλεν*, a cubit, a measure.

‡ Sigmoid, from its resemblance to the antient Greek *ζ*.



76      *Of the Upper Extremity.*

the bone, and called §Olecranon,—to it the tendons of the extensor muscles of the fore-arm are attached,—on the fore part of the sigmoid cavity is the shorter process, called coronoid, printed by the attachment of muscles and ligament,—on the outer side is a smooth surface covered by cartilage, on which the head of the radius rotates,—the body of the bone is covered by muscles, except the internal and external edges,—the internal edge may be distinctly felt the whole length of the bone in the living subject;—to the external edge is attached the \*interosseous ligament,—the lower extremity is nearly cylindrical,—has a surface for articulation with the bones of the carpus; on the inner part is a small sharp process, called †Stiloid, which may be felt in the living body;—on the

---

\* Olecranon, from *ωλενη*, *cubitus*, and *κράνον*, *caput*.

† Interosseous, placed between bones.

‡ Stiloid, styloides, from *στυλός*, *stylus*, a pencil, and *εἶδος*, *forma*.



outer part, a smooth surface receiving the internal part of the lower extremity of the radius.

\*Radius, shorter than the ulna,— Radius.  
smaller above, larger below,—its head or upper extremity hollowed to receive the articulating surface of the os brachii,—neck, covered by capsular ligament,—on the inside of the head is a surface for articulation with the ulna,—a little below the head on the inner side of the bone, is a large tuberosity, into which the tendon of the biceps flexor is inserted,—the body of this bone is rounded on the outside, on the inside has a thin edge, to which the interosseous ligament is inserted.—The upper part of the radius is covered by muscles;— the lower extremity, large,—flattened in the fore part,—rounded on the back,—the surface for articulation a little oblique and oblong,—on the inside, hollowed to receive the lower extremity of the ulna,—on the outside, a process, called stiloïd, projecting be-

---

\* Radius, a staff, a beam.

low the surface for articulation,——this bone is formed of three ossifications.——Reflections on the uses of the interosseous ligament.——An inquiry into the manner, in which the different motions of the fore-arm are produced, with remarks on the manner of treating fractures, and luxations of this part.

Hand.

The hand, divided into three parts, \*carpus, †metacarpus and fingers, comprehending the thumb.——The carpus consists of eight bones, laid together like pavement,——these disposed in two rows, and placed obliquely:——the general figure of the carpus, irregular,——narrow, before, and hollowed considerably,——convex, behind,——in a fore view, plain;——the exterior surfaces of all the bones, strongly printed by ligaments passing from bone to bone and intersecting each other in different directions;——these bones distinguished by proper names, expressive of their general figure.

---

\* Carpus, *καρπός*, the wrist.

† Metacarpus, *μετα* post, and *καρπός*.



1. § Scaphoides, convex above, for articulation with the radius,—hollowed below, for articulation with the os magnum,—rounded on the outside for articulation with the trapezium, a fossa for the attachment of the capsular ligament.

2. \* Os lunare, convex above, for articulation with the radius—concave below, for articulation with the head of the os magnum—on the outside is articulated with the scaphoides, on the inside with the os cuneiforme—has scabrous surfaces for the attachment of ligaments—the scaphoides and lunare together, make an oblong surface for articulation with the lower extremity of the radius.

3. † Os cuneiforme,—upper surface round, is articulated with the lower extremity of the ulna,—has a surface for articulation with the os lunare—is articulated with the os

§ *Scaphoides*, or *cymbiformis*, from *σκαφη*, a skiff, or little vessel, and *ειδὸς* forma.

\* *Os lunare*, from *luna*, resembling an half moon.

† *Os cuneiforme*, from *cuneus*, a wedge, of a wedge-like form.

cuneiforme, and on its fore part, the fourth bone called ‡os pisiforme is placed.

5. \*Trapezium has four sides and four angles, or is rather of a pentagonal figure—has a double surface for articulation with the first bone of the thumb—is articulated with a part of the metacarpal bone sustaining the fore finger, also with the scaphoides, and trapezoides.

6. †Trapezoides is irregular—articulated with a part of the metacarpal bone sustaining the fore finger, with the scaphoides,—os magnum and trapezium.

7. ‡Os magnum has a round head received by the scaphoides and lunare—is articulated with the trapezoides, unciforme and with the me-

‡ Os pisiforme, from *pisum*, a pea.

\* Trapezium, *τραπέζιον*, from its resemblance to a quadrilateral geometrical figure of that name, whose four sides are not equal, and none of its sides parallel.

† Trapezoides, so called from its similarity to the trapezium.

‡ Os magnum, the large bone.

tacarpal



metacarpal bone sustaining the middle finger.

8. § Os unciforme is articulated with the os magnum,—os cuneiforme, and with the metacarpal bones sustaining the ring finger and little one,—the hook-like process projects on the internal part, to which a ligament is attached,—reflections on the attachments of these bones, and on the motions of the carpus.

Metacarpus was by the ancients, considered all that part of the hand that is not fissured, including the first bone of the thumb. The moderns use the term, only to express the four bones placed between the carpus and first bones of the fingers. The first is the longest and strongest; the second shorter than the first,—the third shorter and slenderer than the second,—the fourth shorter than the third, but considerably stronger,—these bones agree with each other in their general characters,—are rounded on the back part, less regular on the

Metacarpus.

---

§ Os unciforme, from *uncus*, a hook, and *forma*, shape.

inside and strongly printed by muscles.—Each bone consists of a body and two extremities—the upper extremity is irregular and articulated with the bones of the carpus—the lower extremity has a rounded head for articulation with the bones of the fingers—the knuckle formed by this rounded extremity——reflections on the motions of the metacarpal bones.

Fingers.

—The bones of the fingers agree with each other in their general characters, differ from each other only, in their degrees of length and strength—each finger consists of a pyramid of three bones, of which the first is the longest and strongest—the second shorter, and the third the shortest—are rounded on the back part—hollowed within. The upper extremity of the first bone, is hollowed to receive the lower extremity of the metacarpal bone—the lower extremity is formed by a pair of condyles, which are received by the upper extremity of the second bone—the lower extremity of the second bone, has also a pair of condyles, which



which are received by the upper extremity of the third bone:—on the internal part of the third bone, are two scabrous surfaces, one, near the upper extremity of the bone, into which, the tendon of the flexor muscle is inserted; the other forming the lower extremity, to which the skin, &c. is firmly connected.

The thumb, like the fingers, consists of a pyramid of three bones:—the first, at its upper extremity, is articulated with the trapezium, and forms a double ginglymoid, having flexion and extension in two opposite directions,—the lower extremity is rounded, and received into a glenoid cavity, formed in the upper extremity of the second bone;—the lower extremity of the second bone has a pair of condyles, which are received in a pair of glenoid cavities, in the upper extremity of the third bone;—the third bone, on its inner side, has a pair of scabrous surfaces, which answer similar purposes to those of the last bones of the fingers.—The sides of the extremities of the bones of the fingers and thumb, are strongly

printed by the attachment of capsular ligaments.—Reflections on the number, situation and offices of the ossa fessamoidea.—General observations on the mechanism of the hand.

*Lower Extremity.*

General observations, on the analogy between the upper and lower extremities.—Reflections on the advantageous direction of the thigh bones; with remarks on the manner in which the trunk is supported on them, and progression performed.

Os Femoris.

\* Os femoris,—its general shape, cylindrical,—is divided into the body and two extremities : —the superior extremity, called head, attached to the body of the bone by a neck,—the head is regularly rounded,—in the middle, is a print made by the insertion of the ligamentum suspensorium,—the lower part of the neck, is marked by the attachment of the capsular ligament;—the head and neck are not

---

\* Os Femoris, gen. of *femur*, the thigh.



placed in the axis of the body of the bone, but make an angle with it;—this angle differs in different persons, —in a well formed thigh bone, the angle is about seventeen and a half degrees,—but in bones that have been softened by rickets, the angle is sometimes a right one;—the upper and outward part of the body of the bone, is formed by a large tuberosity, called great \*trochanter, strongly printed by the insertion of tendons;—on the back part of the bone, between the great trochanter and neck, is a cavity, into which the tendons of many small muscles are inserted,—below the neck, on the inner and under side of the bone, is a lesser tuberosity, called the little trochanter, into which the tendons of some muscles are inserted;—the fore part of the body of the femur, is regularly rounded and smooth,—on the back part is a rough ridge, called *linea aspera*;—this be-

---

\* Trochanters, Trochanteres, τροχαντηρες, two processes on the upper part of the thigh bone, distinguished by major and minor.

gins from the space within the two trochanters, and is continued down in the middle of the bone, about two thirds of its whole length—it then divides into two lines, one of which passes obliquely to each condyle.—The linea aspera is made irregular by the attachment of the flexor tendons of the thigh—the lower extremity is considerably enlarged, and the articulating surface formed into two condyles, the inner one, longer, the external, broader—the sides of the condyles strongly printed by the lateral parts of the capsular ligament—on the back part, between the two condyles, is a cavity, into which the crucial ligaments of the joint are inserted—in the middle of the body of the bone, the medullary canal is placed.—The os femoris originally formed of five ossifications, the two extremities and the trochanters being epiphyses.—Observations on the connections and motions of the joint of the thigh, with remarks on the manner of distinguishing fractures in the neck of the thigh bone;—the manner of discovering luxations of the



the thigh bone explained; with observations on the manner of reducing them.

Leg may be said properly to consist of three bones, viz. tibia, fibula and patella, the last entering into the composition of the joint of the knee—

\*Tibia, an oblong bone of the cylindric class—at its upper part, prismatical, having one edge, and one side, internal,—covered only by common integuments—is divided into a body and two extremities, which are epiphyses—the upper extremity is large and called head, a little below which is a print made by the attachment of the capsular ligament—its upper part formed of two glenoid cavities, adapted to the condyles of the os femoris—between them is a tuberosity, to which the femilunar cartilages are attached,—behind this tuberosity is a fossa, into which the crucial ligaments are inserted—on the outer side of the head of the bone, is a smooth surface covered by cartilage, to which the upper extremity of the fibula is

Tibia.

---

\* Tibia, from *tibia*, a pipe.

articulated—about an inch and a half below the head, is a tuberosity, into which the ligament of the patella is fixed—the body of the bone, except on its internal side, is everywhere printed by the attachment of muscles—the posterior outer edge of the bone, has a ligament attached to it, called interosseous, passing between it and the fibula—the lower part of the body of the bone, is small and rounded, and is the part usually injured in fractures,—the lower extremity of the bone irregular—on the internal part, projecting below the surface for articulation, is a process, called \*malleolus internus—on the outer side is a surface, a little hollowed, adapted to receive the lower extremity of the fibula—the surface for articulation, oblong, and hollowed from the fore to the back part—round the lower extremity is a roughness, made by the attachments of the capsular ligament,—near the

---

\* Malleolus, a little hammer.



upper part of the body of the bone, the medullary canal is placed,—\*Fibula. Fibula. a bone of the cylindric class; made of three ossifications,—enlarged at its extremities,—not given for the purpose of supporting weight, or increasing the variety of motion, but for the convenient attachment of muscles,—its upper extremity, called head, is articulated with the head of the tibia on the outside, but forms no part of the joint of the knee,—the lower extremity is articulated with the inferior extremity of the tibia,—projecting considerably below the surface for articulation,—strengthens the joint of the foot,—is called malleolus externus,—its inner side is smooth, printed by cartilage,—on it the outer part of the astragalus plays,—the body of the bone is irregular, every where covered by the attachment of muscles,—to its inner edge the interosseous ligament is inserted,—the upper part of the body is smallest and most liable to fracture,—reflections on the peculiarities and uses, of the tibia and

---

\* Fibula, Perona, *περόνη*, the lesser bone of the leg.

Patella. fibula.—\*Patella, a bone of the spherical class,—on the external part nearly triangular,—one angle being turned downwards, is called its apex—to it the ligament of the patella is attached, by means of which this bone is firmly connected with the tibia,—to the upper part, called basis, is attached the common tendon of the extensor muscles of the leg,—its inner side is divided into two oblong surfaces by a ridge,—these surfaces are adapted to the condyles of the os femoris, on which the patella plays in the different motions of the knee.—Reflections on the joint of the knee, with observations on the manner of treating fractures and luxations of the patella.—Observations on the incurvations of the bones of the leg.—Foot, how far analogous to the hand,—differs in being joined to the leg at right angles,—is stronger, being adapted to support the weight of the whole body—is arched on the under part,

---

\* Patella, the diminutive of *patina*, a little dish, the knee-pan so called.



from the heel to the balls of the toes—the arch supported by ligaments—weight of the body rests on three points.—Reflections on the general form and uses of the different parts of the foot.—The foot divided into †tarsus, ‡metatarsus and toes.—Tarsus consists of seven bones,—1st. §Os Calcis, of a cuboid figure, has six sides, forms the projecting part of the heel,—on the inside, is hollowed, forming a part of the calcaneum,—is strongly marked by the attachment of tendons and ligaments,—has two surfaces for articulation, with the astragalus,—has one surface for articulation, with the os cuboides.—2d. ||Astragalus placed on the centre of the arch,—above is rounded from the fore to the back part, forming a surface for articulation with the bones of the leg,—the outer side has a surface, which moves on the internal part of

---

† Tarsus, *ταρσος*, the space between the bones of the leg and metatarsus.

‡ Metatarsus, from *μετα* post, and *ταρσος*, *tarsus*.

§ Os Calcis, bone of the heel.

|| Astragalus, *αστραγαλος*, the second bone of the tarsus.

the lower extremity of the fibula,—on the inside, another smooth surface for motion on the malleolus internus,—on the under part two surfaces for articulation, with the os calcis,—on the fore part is a rounded head for articulation, with os naviculare.—

3d. \*Naviculare, hollowed on the back part to receive the head of the astragalus,—on the fore part, is articulated with the three cuneiform bones.—The 4th, 5th and 6th, called *Ossa Cuneiformia*;—that on the inside of the foot, called *cuneiforme internum*, is articulated with a part of the os naviculare on the back part, and on the fore part with the first bone of the great toe;—the next, os *cuneiforme medium* is, on the back part, articulated with the os naviculare, on the fore part with the metatarsal bone of the second toe, on the inside with the *cuneiforme internum*, and on the outside with the *cuneiforme externum*;—the third, *cuneiforme externum*, is articulated,

---

\* Os Naviculare, from *navicula*, from its supposed resemblance to a little vessel.



on the back part, with os naviculare, —on the fore part, with the metatarsal bone of the third toe,—on the inside, with the os cuneiforme medium, and on the outside, with a part of the os cuboides.—7th, \*Os cuboides articulated, on the back part, with the os calcis,—on the fore part, with the metatarsal bones of fourth and fifth toes,—on the inside, with the cuneiforme externum,—on the outer side, is a furrow, in which the tendon of the peroneus longus is lodged.—

*Note, The exterior surfaces of these bones, like those of the carpus, are everywhere deeply printed by the insertion of ligaments passing from bone to bone, and intersecting each other in a variety of different directions.—*

*Reflections on the uses of the tarsus.—*

Metatarsus consists of four bones like those of the carpus,—that which sustains the second toe, the longest,—that sustaining the little one, the shortest and strongest.—The bones of the toes so exactly correspond with those

---

\* Os Cuboides, from *κῦβος*, a cube, and *-ειδής*, form.

of the fingers and thumb, that they need no particular description.—

Observations on the mechanism of the foot, and on the manner in which progression is performed.

### *Of the Cranium.*

The head consists of a number of bones, part of which form the \*cranium or brain-case, the others form the face, in which we include the upper and lower jaw, teeth, &c. the whole making an irregular piece of mechanism.—In a side view, the head is formed of two ovals, which joined, make the whole a short spheroidal triangle.

Cranium, when separated from the bones of the face, is of an ovi-form figure,—the smaller extremity forming the fore-head,—the larger, the hind-head,—is placed obliquely, the axis looking upwards and forwards,—the under part is irregular and called basis of the skull,—the upper

---

\* Cranium, *κεφάλιον*, the brain-case.



part is convex, in general smooth, excepting five projecting parts, which point out the parts of the bones that were first ossified,—the anterior part is called *sinciput*,—the superior middle part, *vertex*,—the posterior part, *occiput*, or *hind-head*,—the lateral parts, *temples*.

Cranium formed of eight bones, one frontal, two parietal, one occipital, two temporal, the \**os ethmoides*, and †*os sphenoides*; the six former of which are proper to the skull, the two latter common to it and the face;—these bones are united to each other by sutures,—the first, connecting the *os frontis* on the back part to the two parietal bones transversely, called ‡*coronal*;—in the upper middle line of the skull, passing from the occipital bone behind to the *os frontis* on the fore part, and

\* *Os ethmoides*, *ἠθμος*, *cribrum*, a sieve, and *εἶδος*, *forma*.

† *Os Sphenoides*, from *σφην*, *cuneus*, a wedge, and *εἶδος*, *forma*.

‡ *Coronal*, from *corona*, a crown or wreath, investing the top of the head.

uniting the two parietal bones, is the \*sagittal future.—*Note, This future is sometimes continued through the middle of the os frontis to the nose.*—On the back part is the †lambdoidal future, articulating the superior part of the os occipitis to the posterior parts of the parietal bones,—from the lower part of the leg of the lambdoidal future, passing transversely to the ‡squamose part of the temporal bone, is the ||additamentum futuræ lambdoidalis, connecting the §petrous portion of the temporal bone to the posterior inferior angle of the parietal bone.—The upper thin part of the temporal bone, called squamose, is articulated to the lower part of the parietal bone by the squamose, or false future.—The bones of the cranium are joined to those of the face by a future, called transferse.—The up-

\* Sagittal, from *sagitta*, an arrow.

† Lambdoidal future, representing the Greek letter  $\Lambda$ .

‡ Squamose, scale-like, from *squama*, the scale of a fish.

|| Additamentum, increase or augmentation.

§ Petrous, rock-like, from *petra*, a rock.



per, regularly rounded,—its sides are flattened, forming the temporal fossæ,—the under part very irregular,—printed by muscular attachment,—perforated in many parts to admit blood vessels, nerves, &c. to enter into and pass from the cavity of the skull.—  
General appearance of the internal part of the skull in a side view,—the superior part pretty regular,—the internal table of the skull furrowed by the artery of the dura mater,—the larger branches running in the \*diagonal line of the parietal bone,—marked by the convolutions of the brain,—in the superior middle line, marked by the longitudinal sinus,—opposite the transverse occipital ridge, furrowed by the lateral sinus,—on the sides of the longitudinal sinus, pitted by the glandula Pacchioni,—at the lower part, or internal basis, is very irregular, divided into three regions, which correspond with the irregularities in the basis of the brain.

---

\* Diagonal line, a line drawn from angle to angle, dividing a square into two equal parts.

—An inquiry into the bony composition of the cranium.—A description of the tables of the skull,—of the diploe, and of the manner in which the arteries, on the external part, communicate with those of the dura mater.—Observations on the manner in which futures are obliterated, with an inquiry into the opinions, that have been at different periods entertained, respecting the uses of futures.—Observations on the original conformation of the skull, and of the manner in which the diploe is formed.

External  
Basis.

A view of the basis of the skull externally,—may be divided into three regions, the anterior being all that part before the pterygoid processes of the sphenoidal bone,—the second region, that part contained between the boundaries of the anterior, included within a line drawn through the mastoid processes of the temporal bones,—the posterior extends from the extreme part of the middle region to the transverse occipital ridge,—the anterior region has the ethmoidal bone



bone placed in the middle, and the superior parts of the orbits on each side,—behind the ethmoidal bone is a part of the body of the sphenoidal bone;—the lateral boundaries of this region are formed by the lateral processes of the os sphenoides;—the foramina, beginning from the fore part, are found in the following order,—in the orbiter ridge of the os frontis, foramen orbitale externum superius, through which passes the opthalmic branch of the fifth pair of nerves,—on the inner side of the orbit, between the orbiter plate of the os frontis and the orbiter plate of the os ethmoides, called os planum, the foramen orbitale internum anterius, through which passes the nasal twig of the opthalmic branch of the fifth pair of nerves,—on the outer side of the orbit, foramen orbitale internum exterius in the lateral process of the sphenoidal bone,—at the posterior part of the orbit, foramen opticum, through which the optic nerve and artery pass,—immediately behind this, foramen lacerum orbitale superius, through it pass the

third and the fourth pair, the first branch of the fifth and the sixth pair of nerves,—above the foramen lacrum, is the foramen rotundum,—through it the second branch of the fifth pair passes,—on the fore part of the pterygoid process, foramen sphenopterigoideum:—the centre of the middle region is formed by a part of the os occipitis,—the pterygoid processes of the sphenoidal bone, rising on each side of the body of the os sphenoids, point out the boundaries of the nose.—Each process divided into two alæ, called ala pterygoidea interna and externa, between which is the fossa pterygoidea,—on the point of the ala pterygoidea interna is placed an unciform process, round which, the tendon of the circumflexus palati plays;—the lateral parts are formed by the petrous portions of the temporal bones;—in each temporal bone is a glenoid cavity, in which the condyles of the lower jaw are received,—before each is a process, called zygomaticus,—on the posterior part of the cuneiform process of the occipital bone,  
the



the condyles of the os occipitis are placed,—behind the pterigoid process, the foramen ovale, through which the third branch of the fifth pair of nerves passes,—behind this, foramen spinosum, through which the artery of the dura mater enters the skull,—between the extreme part of the petrous portion of the temporal bone, and the cuneiform process of the os occipitis, is a hole, which in the fresh subject is filled with cartilage,—in the petrous portion of the temporal bone is a spiral canal for the carotid artery,—behind this is the thimble-like cavity, through which the jugular vein passes,—on the outside of it, a process, called vaginal, into which is placed a process, called stiliform,—between the stiliform and mastoid processes, is the foramen stilomastoideum, thro' it passes the portio dura of the auditory nerve,—between the zygomatic and mastoid processes, on the outside, is the meatus auditorius externus,—under the condyles of the os occipitis, a pair of holes for the passage of the ninth pair of nerves,—

the

the posterior region is principally formed by the inferior part of the os occipitis,—on its anterior part, is the foramen magnum occipitale,—on the lateral parts of the foramen magnum are small holes, which allow veins to pass through them,—the back part of the posterior region is everywhere printed by the insertion of muscles.

Internal  
Basis.

The internal basis of the skull, like the external, is irregular, and may be divided into three regions,—the anterior region, being all that part placed between the anterior \*clinoid processes of the sphenoidal bone,—in the anterior middle part is the cribriform plate of the ethmoidal bone, in the middle of which arises a perpendicular process, being part of the perpendicular plate of the ethmoidal bone, called †crista galli,—the posterior, made by part of the body of the sphenoidal bone, and the sides formed by the internal parts of the orbital processes of the os frontis.—

---

\* Clinoid, from κλινω, lectum, a bed, and εἶδος, forma, resembling the posts of a bed.

† Crista galli, the comb of a cock.



This region is occupied by the anterior lobes cerebri.—The foramina in it arise in the following order,—between the crista galli on the fore part, and the perpendicular spine of the os frontis, is the foramen cæcum,—in the cribriform plate of the ethmoidal bone are many small holes, through which the branches of the first pair of nerves pass to the nose,—under the anterior clinoid processes, the foramina optica.—The middle region, all that part extending from the boundaries of the anterior region, to the spine of the petrous portion of the temporal bone behind,—the middle part is formed by the body of the sphenoidal bone,—in its centre is a cavity, called ‡ sella turcica, in which the pituitary glandule is lodged,—this surrounded by four processes, called clinoid,—two anterior, two posterior,—the lateral parts are made by a pair of deep cavities, formed partly by the lateral processes of the sphenoidal bone and the internal parts

---

‡ Sella turcica, a Turkish saddle.

of the temporal bones,—in these lateral cavities, the middle lobes cerebri are lodged, the foramina are in pairs, and arise in the following way,—under the anterior clinoid process, foramen lacerum orbitale superius,—behind this, foramen rotundum,—a little further back, foramen ovale,—foramen spinosum, and in the petrous portion of the temporal bone, the spiral canal for the carotid artery.—The posterior region is large and more regular in its form,—comprehending all the parts within the spine of the petrous portion of the temporal bone, and the internal transverse occipital ridge,—the middle fore part is formed by the cuneiform process of the os occipitis, behind which, is the foramen magnum occipitale,—the back part is subdivided into two cavities, by the perpendicular spine of the os occipitis,—in these cavities, the two lobes of the cerebellum are placed,—on the anterior lateral part is a hole leading into the petrous portion of the temporal bone, called foramen auditivum, through it the auditory nerve passes,—a little below, a foramen  
for



for the jugular vein and par vagum,—  
*(Note, this hole is sometimes divided into two lesser ones by a process of bone—in such cases, the par vagum and jugular vein pass through different foramina)*  
 —in the middle, the foramen magnum occipitale for the spinal marrow and vertebral arteries,——on the upper part, over the foramen magnum, a pair of holes for the ninth pair of nerves.——Observations on the attachments of the processes of the dura mater.——Os frontis in its general shape resembles a scollop shell,—originally formed of two ossifications,—these commonly unite, and before the time of puberty, the suture is obliterated, it then making but one bone,—in some instances, the suture remains open throughout life;—the outer part pretty regularly rounded,—has two projecting parts, where ossification first began,—the outer edge serrated, forming the coronal suture,—the anterior middle part projects considerably, —made irregular by the articulation of the ossa nasi,—on each side arched, forming the superior or-

Os Fron-  
tis.

biter ridges,—the extreme parts of each orbiter ridge articulated with the os malæ,—the lateral part of the bone forming a portion of the temporal fossa, articulated with the lateral process of the sphenoidal bone,—beneath the orbiter ridges, a pair of broad processes, which form the superior parts of the orbits, — between these processes the ethmoidal bone is articulated,—at the lower anterior part of the bone, the bony plates are at a distance from each other, forming a cavity, called frontal sinus:—the internal part, printed by the convolutions of the brain,—in the middle line, divided into two lateral cavities by a process, called spine of the os frontis,—this, as it recedes from the fore part, is furrowed, and gives lodgment to the anterior portion of the longitudinal sinus,—to it, the \*falciform process of the dura mater is attached.—The †parietal bones

Os Parietalia.

---

\* Falciform, from *falx*, a sickle, and *forma*, shape.

† Parietal, from *paries*, a wall, constituting the sides of the head,—ossa bregmatis, from *βρεγμα*, syn-ciput.



are two in number, convex on the outer part, concave within,—each bone of a quadrilateral figure, consisting of four sides and four angles,—the angles are distinguished by anterior superior, anterior inferior, posterior superior, and posterior inferior:—the anterior side, serrated, and articulated with the back part of the os frontis, forming one half of the coronal suture,—the upper side, serrated, and articulated with its fellow, making the sagittal suture,—the posterior side, articulated with one half of the occipital bone, making a part of the lambdoidal suture;—the inferior side, near the anterior inferior angle, articulated with a small part of the lateral process of the sphenoidal bone;—the middle part, articulated with the squamose portion of the temporal bone, forming the squamose suture;—the posterior inferior angle, being articulated with the mastoid process of the temporal bone, forms the additamentum futuræ lambdoidalis,—the internal part of the bone, furrowed in a diagonal

Os Occi-  
pitis.

line by the artery of the dura mater, the larger branches running from the anterior inferior, to the posterior superior angle; on the upper side, near the superior posterior angle, a small hole, which admits an artery to pass from the external parts to the dura mater.——Os occipitis, a quadrilateral figure, divided into two parts,—all that is above the transverse occipital ridge, forming the upper part of the skull,—all that is below it, placed in the basis of the skull;—the upper part, externally, smooth and regular,—articulated with the two parietal bones, forming the lambdoidal suture,—below, irregular, and printed by the insertion of the extensor-muscles of the head,—in it are the foramen magnum occipitale, the condyles of the os occipitis,—and on the fore part the cuneiform process;—the lateral parts, articulated with the petrous portions of the temporal bones;—the cuneiform process, on the fore part, articulated with the back part of the body of the sphenoidal bone,—under each condyle, a hole



a hole for the passage of the ninth pair of nerves;—on the back part of the condyles, a pair of holes which transmit veins,—the internal part of the bone divided into four cavities, by a crucial spine;—to the upper part of the perpendicular limb, is attached the posterior portion of the falciform process of the dura mater, being also furrowed by the longitudinal sinus;—the transverse limb is opposite to the transverse occipital ridge, and furrowed by the lateral sinuses,—to this limb are attached the lateral processes of the dura mater, forming the Tentorium cerebello super expansum;—the inferior part of the perpendicular limb gives attachment to a process of the dura mater, dividing the two lobes of the cerebellum;—the internal part of the cuneiform process, hollowed, and gives lodgment to the medulla oblongata;—the foramina on the internal part, are the same as those already described on the external part.

Os temporis,—one on each side,—is divided into two parts, a superior  
thin

Os Temp-  
poris.

thin part, called the squamose portion,—an inferior thick irregular one, called petrous portion ;—the squamose portion has an oblique surface for articulation, with the lower side of the parietal bone, on the back part ; and with the lateral process of the sphenoidal bone, on the fore part ; —the external surface of the squamose portion gives attachment to a part of the temporal muscle, and forms the inferior posterior part of the temporal fossa ;—from the squamose portion arises a process, called processus zygomaticus, which, running forwards, is articulated with the os malæ ;—on the under part of the zygomatic process, a glenoid cavity, into which the condyle of the lower jaw is received,—on the fore part of this cavity, an eminence, called tuberosity of the maxilla superior.—The petrous portion irregular,—in it the organ of hearing is contained ;——the external posterior part, articulated with the os occipitis ;——on the fore part of the mastoid process, meatus auditorius externus ;—on the under side, the



the vaginal process, in which, the stiliform process is placed,—between the stiliform and mastoid processes, foramen stilomastoideum,—before the stiliform process, the spiral canal for the caroted artery,—on the anterior point of the petrous portion, meatus auditorius internus,—on the internal side, the squamose portion, marked by the convolutions of the brain;—the petrous portion has a spine, to which the transverse process of the dura mater is attached, and below which, is the foramen auditivum.—

Os Ethmoides, a four-sided figure, placed between the orbiter processes of the os frontis, dividing the two orbits from each other,—the larger part of this bone enters into the composition of the nose,—the superior part is perforated by a number of small holes,—hence called cribriform plate of the ethmoid,—this the only part of the bone seen in the basis of the skull,—the whole bone subdivided into two lateral parts, by a perpendicular plate, forming the upper portion of the septum narium, and

Os Eth-  
moides.

and being continued through the cribriform plate, makes the crista galli, to which the falciform process of the dura mater is attached,—on each side, a smooth bony plate, called os planum, forming the inner side of each orbit,—between the os planum and the perpendicular plate, on either side, an irregular spongy bone is hung out, covered by Schneider's membrane, called os turbinatum superius,—between the os turbinatum superius and os planum, is a number of small cells, called cells of the ethmoid,—these subdivided by very thin bony plates, called ossa papyracea.—Os sphenoides,—placed in the basis of the skull, like a wedge;—on the anterior part, articulated with the orbiter processes of the os frontis,—laterally to the inferior anterior part of the os frontis, to the os malæ and os temporis,—the middle anterior part to the cribriform plate of the os ethmoides,—and the back part to the cuneiform process of the os occipitis.—In an internal view, may be divided into a body and two lateral



lateral processes,——the body, surrounded by four processes, called clinoid, between which, the sella turcica,——in the lateral processes are cavities giving lodgment to the middle lobes cerebri,——under each anterior clinoid process, foramen opticum,——between the anterior clinoid and lateral processes, foramina lacera orbitalia superiora,——behind these, foramina rotunda,——a little further back, foramina ovalia,——and in the posterior points of the lateral processes, the foramina spinosa,——in a front view, the lateral processes form the external parts of the orbits;——the body of the bone divided into two cavities, by a perpendicular plate,——these called sphenoidal sinuses,——below, the anterior parts of the \*pterygoid processes,——in a back view, the surface for articulation with the cuneiform process of the os occipitis,——on each side of the body, foramen sphenopterygoideum,——at the lower part, and on the under side of the pterygoid

---

\* Pterygoid, wing-like, from πτερυξ, *ala*, a wing, and εἶδος, *forma*.

processes, alæ pterygoidæ, arising from the lateral parts of the bone,—those on the back part subdivided into two processes, called ala externa and ala interna, between which the fossa pterygoidea,—on the ala interna is an unciform process, round which the tendon of the circumflexus palati plays,—the lateral parts complete the temporal fossæ.

*On the Bones of the Face.*

Face.

The face shewn in a variety of sections, and the parts of the face and nose particularly specified.—The bones of the face, besides the lower jaw and teeth, are thirteen in number, viz. six pairs and one azygos,—The bones of the face and nose, are united to those of the skull by the transverse suture.

Offa Nasi.

Offa Nasi,—are two in number,—convex on the outer part, hollowed within,—at the upper part of the nose, are articulated to the middle part of the os frontis by the transverse suture,—in the middle line of the face, to each other by a proper suture,



future,—laterally, to the nasal processes of the maxillary bones,—and at the lower part, to the cartilaginous part of the nose;—near the middle of each bone, is generally a foramen, that admits of an artery to pass through it.

Os Malæ,—of a four-sided figure, Os Malæ.  
having four sides and four angles,—the superior part is articulated with the outer part of the orbiter brim of the os frontis,—posteriorly, with the zygomatic process of the temporal bone, forming the zygoma,—anteriorly, with the outer part of the maxilla superior, and forms the outer part of the orbit,—between, the lateral process of the sphenoidal bone, and the orbiter process of the maxilla superior, is the foramen lacerum orbitale inferius,—on the outer part of the bone, is a small hole, which admits of an artery and vein to enter, and of a nerve to come from the orbit.

Os Maxillare Superius is a bone of Os Maxillare superius.  
an irregular figure on the outer side,  
—a little hollowed on the fore part,

to which muscles are attached,—on the back part, rounded, forming the tuberosity of the upper jaw,—above, a surface for articulation with the os malæ, on the fore part of which is the foramen orbitale externum inferius,—the upper part is drawn out into two processes,—the anterior, called nasal, is at its upper part articulated by the transverse suture to the os frontis,—on the inside, is grooved, forming the ductus ad nasum,—the posterior process, called orbiter, is smooth, and forms the lower part of the orbit,—the internal part of the body of the bone is hollow, forming the Antrum Highmorianum,—on the inside, irregular, forming a part of the nose,—has an horizontal process, called palatine, by which it is articulated with its fellow,—this process forms the anterior part of the roof of the mouth,—behind the palatine process, a surface for articulation with the os palati,—on the under part are the alveoli, in which the teeth are placed.

Os



Os Unguis, of a four-sided figure, extremely thin,—grooved on the fore part to give lodgment to a part of the *fasciulus lacrymalis*,—is articulated above, with the orbiter process of the *os frontis*,—behind, with the *os planum*,—below, with the orbiter process of the *maxilla superior*,—and before, with the nasal process of the maxillary bone.

Os Un-  
guis.

Os Palati, a bone of an irregular figure,—has a process, which forms the back part of the palate,—is articulated with the palatine process of the *maxilla superior* on the fore part, and to its fellow on the opposite side,—has a process articulated to the posterior part of the upper jaw,—behind, is articulated to the fore part of the pterygoid process of the sphenoidal bone,—a small portion of this bone comes into the orbit,—between the pterygoid process and the inferior process of this bone, is a hole, called *foramen sphenopalatinum*,—and in the palatine process, the *foramen palatinum*.

Os Pa-  
lati.

Os Turbinatum Inferius, is an irregular spongy bone hung out in the cavity

Os Tur-  
binatum  
Inferius.

cavity of the nose, covered by Schneider's membrane,—articulated to the internal part of the maxillary bone,—under it, is the opening of the ductus ad nasum.

**Vomer.** Vomer forms the posterior part of the septum narium,—behind, is articulated with the middle lower part of the body of the sphenoidal bone,—before, with the perpendicular plate of the ethmoid,—beneath, with the palatine processes of the maxillary bone, and with the ossa palati.

**Lower Jaw.** Lower Jaw,—its general figure like the consonant V,—originally formed of two ossifications, united on the fore part, and called symphises,—is everywhere printed by the attachment of muscles,—the under part, called basis,—from it arises, at right angles, a broad process for articulation,—the posterior part of the basis, called angle,—the process of the jaw is subdivided into two lesser processes, the posterior one is formed into a condyle for articulation with the glenoid cavity of the temporal bone,—the other drawn into a thin spine, called

coro-



coronoid ;—on the upper part are the alveolar processes, in which the teeth are placed ;—on the internal part of the process of the jaw, is a hole, which admits of an artery, vein and nerve, to supply the parts of the jaw and teeth ;—this canal opens on the fore part, near the symphysis.

The teeth in the adult subject, are Teeth. thirty-two in number—sixteen in each jaw,—these being in pairs, in order to understand them, we need only examine one side of the jaw.—Teeth are divided into the following classes :—the two anterior, called incisors ;—the third, cuspidatus ;—the fourth and fifth, bicuspidates ;—the three last, molares :—these specified ;—each tooth divided into basis, body, neck and phang :—their parts explained ; each tooth has a cavity corresponding with its general figure,—the cavity lined with a vascular membrane, on which the nerves of the teeth are spread out.—An Inquiry into the bony structure of the teeth, and of the enamel.—Observations on the manner in which the teeth are originally formed ;—on  
the

the manner of the coming of the teeth, &c.—the first set generally make their appearance about the 6th month, are twenty in number;—begin to fall about the 6th or 7th year.

Reflections on the growth of the second set of teeth, with observations on their diseases.

An exhibition of the different appearances produced by disease of bones.—An Inquiry into the causes and effects—of rickets;—on softness of bone from—idiosyncrasy;—on the manner in which bones are affected by exposition to the air.—On the effects of compound fractures.—On the venereal caries.—On caries originating from inflammation in the bony substance;—how differing from caries produced by diseases in the cavity of bone.—On the spina ventosa.—On exostoses.—On the pedarthrocasis.—On the anchylosis of bone.

END OF THE SECOND SECTION.



---

## Section the Third.

---

### On *M Y O L O G Y*.

**A**N inquiry into the general properties of muscles:—1st, Muscles are generally oblong, going from one bone to another.—2dly, Each extremity has tendinous fibres,—these commonly run in the direction of the muscle,—but are sometimes reversed.—3dly, The common connecting medium is, on the outer part of the muscle, compacted, and has commonly been called *membrana communis musculorum*.—4thly, In young subjects, there is no fat in the interstices of the muscular fibres,—in old persons, fat sometimes, found in considerable quantity.—5thly, Arteries ramify in muscles, to the utmost minuteness; the larger branches being always found parallel to, or in the interstices of

R

the

the fibres,—frequently anastomose,—have veins, which are generally full of valves,—have lymphatic vessels.—6thly, Nerves bear a greater proportion to the volume of the muscle, than to any other part of the body,—nerves enter muscles at different parts.—7thly, Tendons are to muscles, what ligaments are to bone;—some muscles without tendons.—Tendinous fibre, not a continuation of the muscular fibre.—The proportion between tendon and muscle the same at all periods of life.—8thly, Tendinous fibres do not contract in the action of muscular fibres;—the fleshy fibre is capable of shortening itself actively,—may be lengthened passively.—The use of tendons, to connect muscle to bone, tendons—are made small to render the limbs more active, and to throw the weight of the muscles nearer to the trunk.—Inserting tendons longer than originating tendons.—Connecting membrane gives form and regularity to the muscle, whilst it allows motion among its parts.—Nerves, the immediate cause of contraction



traction in muscle,—have no contractile power inherent in them, independent of nerves,—have arteries and veins for nutrition.—Blood, not the efficient cause of contraction—red colour, a property not inherent in muscle,—in the intestines, muscular fibres pale,—in fish, white,—in insects, diaphanous.—The red colour of the muscle depends on the quantity of blood it receives.—The properties of tendons explained.—Muscles have the following attachments:—1st, to bone, often penetrating the substance,—2dly, to periosteum,—these generally said to arise from the bone, at that part,—3dly, to cartilage, as those of the ribs,—4thly, to perichondrium, as those of the external ear,—5thly, to ligaments,—6thly, to membranes, as those of the eye,—7thly, to tendons, as the lumbricales,—8thly, to flesh, as the tongue, uvula, &c.—9thly, to skin, as the muscles of the face, &c.—Muscles divided into different kinds, as oblong, hollow, and mixed;—the oblong are subdivided

into different classes, rectilinear,——simple penniform,——complete penniform,——complex-penniform, and radiated;——the uses of these different muscles explained.——Hollow muscles are those surrounding cavities, having their fibres of different lengths, and in different directions, as the heart, intestines, &c.——Mixed muscles, such as partly surround cavities, as those of the abdomen.——The uses of these different muscles explained.——Every muscle divided into head, or origin, belly, or body, consisting of muscular fibres, tail, or insertion, made of tendon,——these parts distinct in the larger muscles.——Muscles, besides tendons, have appendages,——1st, fasciæ,——broad tendinous expansions, or, aponeuroses, to keep parts in their situation.——2dly, Thecæ, annular, or, transverse ligaments, to keep tendons from starting.——3dly, Trochleæ, to alter the direction of tendons.——4thly, Bursa tendinibus subjectæ, or facculi mucosi, where tendons or ligaments play over bones, they contain synovia



synovia, and prevent abrasion:——the tendons of some animals bony.

*On the Muscles of the Abdomen.*

After having removed the common integuments from the fore part of the abdomen, the muscles of the belly appear:——the anterior part of the parietes is covered by a broad thin tendinous expansion, marked in different parts by lines, which are distinguished by the following names:——in the middle line of the body, extending from the xyphoid cartilage to the symphises pubis, is a white line, called *linea alba*,—its breadth increases from the xyphoid cartilage to the umbilicus,—then decreases to the pubes;—on each side is a curved line, called *linea femilunaris*;—between the cartilaginous margin of the chest on the fore part and the navel, are three or four transverse lines, called *lineæ transverse*;——the abdominal muscles are five pairs in number, and arise in the following order.

NAME

NAME	ORIGIN	INSERTION.	USE.
OBLIQUUS DESCENDENS, vel OBLIQUUS EXTERNUS.	Arises by slips from the eight inferior ribs, about two inches from the cartilaginous margin of the chest; the four superior making digitations with the <i>ser-ratus major anticus</i> ; the 4 inferior with the <i>latissimus dorsi</i> .	Inserted into the whole length of the linea alba on the fore part, below fleshy, to the outer labrum of the spine of the illium, as far as the anterior superior spinous process— from the superior spinous process to the os pubis, tendinous, which is continued into the fascia of the thigh—this, called Poupart's ligament, is perforated making the ring of the abdominal muscle, for the passage of the spermatic cord in the male, and round ligaments in the female.	To compress the abdomen in expiration, —assists in the expulsion of the urine, feces, & foetus, — when both act, the body is bended forwards—when one acts unassisted by other muscles, the body is turned to a side.

OBLIQUUS



**OBLIQUUS  
ASCENDENS--  
vel OBLIQUUS  
INTERNUS.**

Arises tendinous from the fascia lumborum, from the middle part of the spine of the ilium, from the anterior part of the ilium and os pubis.

**TRANSVER-  
SALIS ABDO-  
MINIS.**

Arises by a broad thin tendon, from the transverse processes of the vertebræ lumborum, — fleshy from the inner margin of the spine of the ilium—from the internal part of the cartilaginous margin of the chest, making digitations with the diaphragm.

Is inserted into the cartilaginous margin of the thorax, and into the whole length of the linea alba.

Is fixed by a broad tendon into the whole length of the linea alba—its tendon passes behind the rectus and forms a sheath.

In its action similar to the former; the fibres decussating, strengthen the parietes.

Compresses the lateral parts of the abdomen in respiration.

NAME.	ORIGIN.	INSERTION.	USE
RECTUS ABDOMINIS.	Arises by a thick short tendon from the superior anterior part of the os pubis—is divided into three or four distinct muscles by the <i>lineæ transversæ</i> .	Is inserted into the cartilages of the 5th, 6th, and 7th ribs, near the sternum.	It compresses the anterior part of the abdomen,—bends the trunk, & raises the pelvis towards the trunk
PYRAMIDALIS.	Arises fleshy from the anterior middle part of the os pubis.	Is inserted into the <i>linea alba</i> , a little below the umbilicus.	Compresses the bladder, and the lower part of the cavity of the abdomen.



*On the Male Organs of Generation.*

Male organs are divided into the internal and external parts,—all contained within the pelvis, internal,—all without, external,—in order to understand them, they must be traced in the course of the secretion of semen, &c. A general view of the blood-vessels contained in the cavity of the abdomen ;—the testicles, tho' lodged in the scrotum, receive their blood-vessels from the aorta.—Reflections on the ring of the abdominal muscles, and on the manner in which the blood - vessels pass through. — The blood-vessels going to the testicles, called spermatic ;—each testicle receives an artery, that arises from the fore part of the aorta, immediately below the emulgent.—The veins accompany the arteries,—that on the right side opening into the fore part of the cava inferior, near the emulgent vein ;—that on the left, opening into the emulgent vein on the same side.—The nerves come from the par vagum and intercostal—attend the  
S
arteries.

arteries.——*Note, the blood vessels and nerves going to the testicles are behind the peritonæum.*——Spermatic chord consists of the following parts, — spermatic artery and vein, nerves, lymphatic vessels, and the vas deferens, or excretory duct;—these are united by reticular substance—have a common covering, called tunica vaginalis communis:—this formed by an expansion of the tendon of the external oblique, cremaster muscle, and the ligamentous remains of a process of the peritonæum.—Tunica vaginalis communis, invests not only the chord, but the external part of the testicle.——Tunica vaginalis propria testis, is a complete bag or reflected membrane, immediately investing the body of the testis—in it the water collected in the hydrocele is contained.—The testicle is divided into two parts,—the larger anterior rounded part called body,—on the back part, an oblong process, called epididymis—these covered with tunica albuginea.—The outer part of the tunica albuginea formed by the inner portion of the  
the



the tunica vaginalis propria testis.—The internal part of the testicle consists of a congeries of tubes, extremely convoluted,—these intersected by small ligamentous chords, which pass from one side of the tunica albuginea to the other.—The tubes of the testicle unite at the upper part, and form the rete testis;—the tubes uniting form about thirteen larger tubes, called vasa afferentia—these run on, to form the upper part of the epididymis.—The epididymis is one long convoluted tube, made by the union of the vasa afferentia,—this becoming larger at the extreme or lower part, makes the vas deferens, which being continued on, forms a part of the spermatic chord.—The blood vessels of the testes run convoluted, or in a serpentine direction—hence, have been called, vasa pyramidalia, and by some vasa pampyneiformia. — The extreme branches of the spermatic vessels ramify on the tubes of the testis, into which the semen is secreted.—The testicles, in the early period of life, situated behind the peritonæum, in the cavity of the abdomen, near the kidneys—generally descend about the

seventh month, frequently later, and sometimes, not till the time of puberty,—in some instances, have remained in the cavity of the abdomen, throughout life.—The testicles descend in the following manner:—from the lower part of each testicle, going to be inserted into the scrotum, is a ligamentous substance, called gubernaculum, —the testicle gradually descending, takes with it a process of the peritonæum, —in its passage through the ring of the external oblique, it receives a tendinous expansion from that muscle, which, with the cremaster, forms the tunica vaginalis communis;—immediately after the descent of the testicle is a vaginal sheath, leading from the cavity of the abdomen to the body of the testis—the gut protruding immediately after the descent of the testis, forms hernia congenita, the testis and gut being in contact.—Shortly after the descent of the testis, the peritonæal process, at its upper part, becomes obliterated,—the lower part remaining open, forms tunica vaginalis propria testis.—Remarks on hernias.

*Scrotum.*



*Scrotum.*

Scrotum, a purse or bag formed for the reception of the testis,—externally, is formed of common integuments,—internally, of a bed of loose reticular substance, in which the testes are lodged,—divided into two sides by a septum,—on the outer part, has a raphe.—Dartos muscle cannot be demonstrated.—Fat never found in the scrotum.

*Penis.*

Penis consists of three spongy bodies, *viz.* two corpora cavernosa, and one corpus spongiosum urethræ.—The two cavernose bodies are covered by a strong inelastic ligamentous membrane,—are united to each other from the anterior part, two thirds of their whole length,—at their posterior part, they diverge and form the crura penis,—these attached to the bones of the pubes;—between the two corpora cavernosa, the pecten,—their internal parts intersected by small ligamentous

mentous fibres,——the internal substance not cellular, but consisting of blood vessels variously convoluted.—Corpus spongiosum urethræ has the urethra passing through it,——begins from the membranous part of the urethra,——at that part is enlarged, forming the bulbous part of the urethra,——is continued on the under part of the corpora cavernosa, and at the end of these, is enlarged, covering their extremities, and forming, what has by some been called, the corpus quartum or glans penis,——has a more delicate ligamentous covering than the corpora cavernosa.——The corpora cavernosa and corpus spongiosum are united by condense reticular substance,——their internal texture nearly the same,——these are covered by the common integuments, but have no fat.——The arteriæ pudicæ enter the crura penis,——some branches pass into the corpus spongiosum urethræ, and ramify to all parts,——a small part runs in dorso penis, supplying the integuments with blood,———this blood is returned by two veins,——one lying in dorso penis, in the space between the  
two



two corpora cavernosa, returns the blood from the centre of the penis, which is carried to it for the purpose of erection,—this is called vena magna ipsius penis;—the other, superficial, returns the blood from the integuments,—is called vena tegmentorum.—The glans penis, covered by a folding of the skin, called præputium,—this, at its lower part, attached to the under side of the glans, takes the name of the frænum.—The penis has the following muscles.

NAME.	ORIGIN.	INSERTION.	USE.
ERECTOR PENIS <i>seu</i> IS- CHIO-CA- VERNOSUS.	Arises from the branch of of the ischium and pubis.	Is inserted into the crus penis by a broad tendon, spread over it as far as the symphysis pubis.	Does not erect the penis, but gives to it greater turgescency in erection.
ACCELERATOR URINÆ <i>seu</i> EJACULATOR SEMINIS.	Arises from the internal part of the branch of the os pubis, and from the li- gamentous part of the crus penis.	Meets with its fellow from the opposite side, and uni- ting with it in a common tendon, the two form a complete penni-form mus- cle, covering the whole bulb of the urethra.	Expels the last drops of the u- rine, and assists in the ejection of the semen.
TRANSVER- SALIS PERI- NÆI.	Arises from the inside of the tuberosity of the is- chium.	Inserted into the corpus spongiosum, near the bulb.	Dilates the bulb, for the reception of the semen. SPHINCTER



SPHINCTER  
ANI.

Surrounds the lower part of the gut, and is spread under the skin, about an inch from the verge of the anus.

LEVATOR  
ANI.

Arises from the internal part of the pelvis, a little below its bony brim.

Its fibres, being circular, terminate in each other.

Is a broad muscle, and inserted into the lower side of the rectum.

Constricts the anus, and prevents the involuntary discharge of the faeces.

Prevents an inversion of the rectum in the exclusion of the faeces.

*A Side View of the Contents of the Pelvis.*

The contents of the pelvis in the male, are the bladder on the anterior part,—that side only, which is next to the cavity of the abdomen, covered by peritonæum;—on the posterior part, following the sweep of the sacrum, is the rectum;—at the under part of the bladder, between it and the rectum, vesiculæ seminales;—between these, surrounding the neck of the bladder, the prostate gland;—behind the peritonæum, the ureters, bringing the urine from the kidneys to the bladder,—and the vasa deferentia, conveying the semen from the testicles to the vesiculæ seminales:—The exact situation and connection of these parts will be here particularly pointed out.

*Vesiculæ Seminales.*

When cut through transversely, exhibit the appearance of cells,—when carefully unravelled, are found



to consist of one tortuous tube,—the internal surface, villous and extremely vascular.——The vas deferens enters the ring of the abdominal muscle, and when in the cavity of the abdomen, separates from the blood vessels, then passing over the brim of the pelvis, gets to the under part of the bladder, and opens into the duct of the vesiculæ feminalis;——vesiculæ feminales attached to the bladder by reticular substance.

*Bladder.*

Bladder receives a partial covering from the peritonæum,—has a coat consisting of muscular fibres, called Detrusor urinæ,—this coat may be divided into two layers, one external, consisting of fibres running from the neck towards the fundus of the bladder,—the other of circular fibres, investing it transversely;——the internal part is lined by a thin dense membrane to prevent transudation,—is vascular, but not villous,—this membrane has a mucus secreted on it.—The penis cut through on the back

part, and the urethra and bladder laid open, the following parts appear:—the recipient orifices made by the openings of the urethers, and the expellent orifice,—these form nearly an equilateral triangle.—The neck of the bladder, in the human subject, is an imaginary line.—From the expellent orifice of the bladder to the bulb of the urethra, is called membranous part of the urethra;—the upper portion is invested by the prostate gland,—on the back part is a ridge, called *Caput Gallinaginis*, in the middle of which, is a blind hole, called *foramen cæcum*; on each side the openings of the feminal ducts, called *oculi gallinaginis*,—the internal part of the bladder seems continued on, to form the internal membrane of the urethra.—The whole length of the urethra is studded with glands, that have long excretory ducts, called *lacunæ*—one of these situated about half an inch within the *meatus urinarius*, at the upper part of the passage, is large, and called *lacuna magna*.—The mucus, for the lubrication of the urethra, is secreted by these glands.

*Prostrate*



*Prostrate Gland.*

Prostrate gland is of a triangular figure, nearly representing the form of a heart, as painted on cards,—is extremely vascular—secretes a brown fluid, that is poured into the upper part of the urethra.—General observations on the connections of the spermatic organs.

**MUSCULUS**

NAME.	ORIGIN.	INSERTION.	USE.
<p>MUSCULUS FRONTALIS VERUS, <i>vel</i> <i>Corrugator</i> <i>Coiteri</i>.</p>	<p>Arises from the lower middle part of the os frontis, from the ossa nasi, and nasal process of the maxillary bone.</p>	<p>Passing obliquely upwards and outwards is inserted into the skin of the forehead, above the eyebrow.</p>	<p>Brings the skin of the forehead towards the nose, as in frowning.</p>
<p>OCCIPITO FRONTALIS.</p>	<p>The frontal portion arises from the inferior part of the os frontis and superior orbiter process,—the occipital portion from the transverse occipital ridge.</p>	<p>Each portion forming a broad thin tendon, unite at the upper part of the head, this tendon joining with its fellow below on the opposite side, forms a tendinous expansion covering the upper part of the skull.</p>	<p>Corrugates the skin of the scalp and forehead.</p>



APERIENS PALPEBRAM, <i>vel Rectus Palpebræ.</i>	Arises at the lower part of the orbit, near the foramen opticum.	Inserted into the cartilage of the upper eye-lid.	Raises the upper eye-lid, and opens the eye.
ORBICULARIS PALPEBRARUM, <i>sive Sphincter Oculi.</i>	Arises by a small round tendon from the internal part of the os nasi, and nasal process of the maxillary bone.	Spread out under the skin of the eye-lids, covering the upper part of the cheek.	By raising the lower eye-lid and depressing the upper one, closes the eye.
RINÆUS, <i>Nasalis seu Rectus Nasi.</i>	Arises from the upper part of the os nasi, and nasal process of the maxillary bone.	Inserted into the cartilaginous part of the nose.	By drawing the ala nasi outwards dilates the nose.

## ZYGOMA.

N A M E.	O R I G I N.	I N S E R T I O N.	U S E.
ZYGOMAT- ICUS, <i>sive</i> Dis- tortor Anguli Oris.	Arises from the Zygoma.	Inserted into the angle of the lips.	Raises the angle of the mouth.
ELEVATOR LABIORUM COMMUNIS.	Arises from the outer part of the maxilla superior.	Inserted into the angle of the mouth.	Raises the lip.
ELEVATOR LABII SUPE- RIORIS PRO- PRIUS ALÆ- QUE NASI.	Is a broad muscle arising from that part of the max- illa superior, below the orbit.	Inserted into the upper lip and ala nasi.	Raises the lip.
ORBICULA- RISORIS, <i>vel</i> <i>Sphincter La- biorum.</i>	The fibres of this muscle are orbicular, and spread out under the skin of the lips.	Inserted into the skin of the lips.	By contracting the skin of the lips, closes the mouth. DEPRES-



DEPRESSOR LABIORUM COMMUNIS-- <i>sive Triangularis.</i>	Arises from the fore part of the basis of the lower jaw.	Inserted into the side and angle of the lips.	Depresses the angle of the mouth.
DEPRESSOR LABII INFERIORIS PRIUS.	Arises from the fore part of the basis of the lower jaw.	Inserted in the middle part of the lower lip.	Depresses the under lip.
DEPRESSOR LABII SUPERIORIS PRIUS.	Arises from the alveolar processes on the fore part of the maxilla superior.	Is inserted into the superior part of the upper lip.	Depresses the upper lip.
ELEVATOR LABII INFERIORIS PRIUS.	Arises from the alveolar processes on the fore part of the lower jaw.	Is inserted into the lower lip and skin of the chin.	Raises the lower lip and chin.

NAME.	ORIGIN.	INSERTION.	USE.
BUCCINATOR.	Arises from the alveolar processes of both jaws.	Inserted into the angle of the lips.	Contracts the cavity of the mouth, counteracts the tongue, and applies the food to the circle of the teeth in mastication.
QUADRATUS GENÆ, vel LATISSIMUS COLLI.	Arises from the skin of the breast and shoulder.	Is spread out under the skin of the neck, and inserted into the basis of the lower jaw, skin of the cheek and angle of the lips.	Depresses the lower jaw and lips.



ANTERIOR AURICULÆ.	Arises from the os malæ and maxilla superior.	Inserted on the anterior carti- laginous part of the mea- tus auditorius.	Dilates the mea- tus auditorius.
ELEVATOR AURICULÆ.	Arises from the fascia of the temporal muscle.	Inserted into the cartilage of the ear.	Raises the auri- cula.
RETRACTOR AURICULÆ.	Arises from the transverse process of the occipital ridge and fascia of the occi- pito frontalis.	Inserted to the posterior part of the concha.	Dilates the mea- tus auditorius.

## NAME.

## DIAPHRAGMA.

## ORIGIN.

Has by some been considered as consisting of two muscles,—on the anterior part, its fibres are radiated,—on the back part, rectilinear,—the anterior part arises about an inch within the cartilaginous margin of the thorax, making digitations with the transversalis abdominis:—the posterior part, called crura of the diaphragm, arises from the anterior and lateral parts of the bodies of the three or four superior vertebrae lumborum, and from the fore part of the body of the last vertebra dorsi;—between the crura, the œsophagus passes into the cavity of the abdomen.

## INSERTION.

The tendinous fibres of all parts of the muscle unite in the middle, and form the centrum tendinosum;—this tendon is perforated to admit the cava inferior to pour its contents into the heart;—it also admits of the aorta, thoracic duct, and œsophagus, to pass from the chest into the abdomen.

## USE.

Is concave towards the cavity of the abdomen,—convex towards the cavity of the chest:—in its action endeavours to reduce itself into a straight line,—enlarges the cavity of the chest, in inspiration, and counteracts the abdominal muscles.

O.



*Os Hyoides.*

Os hyoides, in its form, represents the *u* consonant,—its anterior part or basis is broad, printed by the attachment of muscles,—on its inner part is hollowed, having a ligament inserted into it, by which it is attached to the fore part of the thyroid cartilage,—its lateral parts called horns,—between the basis and horns of this bone, a little process, called graniform appendage, is attached to it by a ligament.—The horns of the os hyoides are connected to the superior processes of the thyroid cartilage by ligaments,—in the middle of each ligament is a graniform cartilage.—All parts of this bone strongly printed by the attachment of muscles.

*Thyroid Cartilage.*

Thyroid Cartilage forms the anterior part of the larynx, or that part of the throat called *pomum adami*,—hollowed on the outside,—at the superior posterior part, a pair of processes,

cesses, by which it is connected with os hyoides,—at the inferior, a pair of processes, by which it is articulated to the cricoid cartilage,—at the superior posterior part, is articulated with the aretenoid cartilages,—on its fore part, is printed by muscles.

### *Cricoid Cartilage.*

Cricoid Cartilage, broad at the back part, narrow before like a ring,—is articulated with the lower part of the thyroid cartilage, making the inferior part of the larynx,—the superior parts of the larynx formed by a pair of cartilages, called aretenoid;—each aretenoid cartilage is triangular,—the basis articulated to the superior posterior part of the cricoid,—their apices approach each other, and form the aperture of the glottis:—to these cartilages, the the sacculi laryngis are attached.



NAME.	ORIGIN.	INSERTION.	USE.
MASSITER.	Arises by three heads,—the first from the maxillary bone, near its junction with the os malæ,—the second from the zygomatic process of the os malæ and os temporis,—the third from the internal part of the zygoma.	Is inserted into the external part of the process of the lower jaw, from the angle, extending almost as far forwards as the middle part of it.	Raises the jaw, and carries it backwards in the act of mastication.
TEMPORALIS five Crurapbites.	Arises from the whole temporal fossa, is covered by a strong tendinous expansion which gives origin to some of the fibres.	Is inserted into the coronoid process of the lower jaw.	Raises the jaw.

NAME.	ORIGIN.	INSERTION.	USE
PTERIGOIDEUS INTERNUS, <i>seu massiter. internus.</i>	Arises from the ala pterigoidea interna, and fossa pterigoidea.	Is inserted into the internal part of the process of the lower jaw, opposite to the massiter.	Assists the two former muscles in raising the lower jaw.
PTERIGOIDEUS EXTERNUS.	Arises from the ala externa pterigoidea, and from the adjacent parts.	Is inserted into the condyloid process of the lower jaw.	Moves the jaw laterally.



<p><b>DIGASTRICUS</b>—<i>seu biverter.</i></p>	<p>Has two fleshy bellies and one middle tendon—the posterior part arises from a cavity on the inner side of the mastoid process—forms a round tendon, which passes through the tendon of the stilo-hyoideus, is tied by a ligament to the lateral part of the basis of the os hyoides.</p>	<p>The anterior belly is inserted into a tubercle, on the inside of the basis of the lower jaw, near the symphysis.</p>	<p>Depresses the lower jaw.</p>
<p><b>MASTOIDÆUS</b>, <i>seu Sternocleidomastoideus.</i></p>	<p>Arises by a strong, round tendon from the anterior superior part of the first bone of the sternum, and by a broad, thin tendon from the superior sternal extremity of the clavicle.</p>	<p>Is inserted into the inferior external part of the mastoid process; and by broad thin tendon into the anterior part of the transverse occipital ridge.</p>	<p>Moves the face to the opposite side—when the two act, the head is bended forwards.</p>

NAME	ORIGIN	INSERTION.	USE.
STERNO-HYOIDÆUS.	Arises from the inner part of the first bone of the sternum, and from the cartilage of the first rib.	Is inserted into the fore part of the basis of the os hyoides.	Draws the os hyoides downwards.
MYLO-HYOIDÆUS.	Arises fleshy from all the internal edges of the alveolar processes of one half of the lower jaw.	Is inserted into the inferior margin of the os hyoides.	Draws the os hyoides upwards, forwards and laterally, according to the action of the different parts of the muscle.
GENIO-HYOIDÆUS.	Arises from a tubercle on the inside of the lower jaw, near the symphysis.	Is inserted into the whole length of the os hyoides.	Raises the bone and brings it forwards.



STILO-HY- OIDÆUS.	Arises by a round tendon from the middle part of the stili-form process.	Is inserted into the basis of the os hyoides, near its horn.	If one muscle acts it is moved to a side—if both act it is raised and carried backward. In its action assists the preceding muscle.
STILO-CHON- DRO-HYOI- DÆUS — <i>seu</i> <i>stilo - byoidæus</i> <i>alter.</i> CORA- COHYOIDÆUS	Arises from the lower part of the stili-form process.	Inserted into graniform appendage of the os hyoides.	
	Arises from the superior costa scapulæ, and from the ligament that forms the lunate cavity into a hole, passing obliquely up the neck—has a middle tendon where it is pressed upon by the sterno mastoidæus.	Inserted, by a broad thin tendon, into the fore part of the basis of the os hyoides.	Draws the os hyoides obliquely downwards and backwards.

NAME.	ORIGIN.	INSERTION.	USE.
GENIO-GLOSSUS.	Arises from a tuberosity, on the internal middle part of the lower jaw—the fibres radiate from its origin.	Is inserted into the tongue, its whole length.	Being a radiated muscle, different portions acting will produce different effects.
HYO-GLOSSUS, by some divided into 3 distinct muscles, viz. <i>bassio-glossus</i> — <i>chondro-glossus</i> —and <i>cervico-glossus</i> .	Arises from the horn, and one half the basis of the os hyoides.	Is inserted laterally into the basis of the tongue.	When one acts, the tongue is carried obliquely to a side, when both, downwards and backwards.



STILO-GLOSSUS.	Arises from the stili-form process.	Is inserted into the middle and posterior part of the side of the tongue.	Raifes the tongue and carries it to one side.
LINGUALIS.	Consists of fibres running from the apex to the basis of the tongue.		Shortens the tongue.
STERNO-THYREOIDÆUS.	Arises from the internal part of the first bone of the sternum.	Inserted into an oblique ridge, on the side of the thyroid cartilage.	Depresses the larynx.
HYO-THYREOIDÆUS.	Arises from the anterior part of basis of the os hyoides.	Inserted into the oblique ridge, on the side of the thyroid cartilage.	Raifes the larynx.
CRICO-THYREOIDÆUS.	Arises from the anterior part of the cricoid cartilage.	Inserted into the inferior lateral part of the thyroid cartilage.	By moving the thyroid cartilage to a side, enlarges the cavity of the larynx.

NAME.	ORIGIN.	INSERTION.	USE.
ARYTÆNOIDEUS MAJOR.	Arises fleshy from the basis of the arytenoid cartilage on the one side.	Is inserted the whole length of the arytenoid cartilage on the opposite side.	Brings the arytenoid cartilages to each other, and contracts the aperture of the glottis.
ARYTÆNOIDEUS MINOR, <i>seu arytenoideus.</i>	A small muscle arising from the lateral part of the basis of the arytenoid cartilage on the one side.	Passing transversely to the opposite cartilage is inserted into it.	Assists the former muscle in its action.
CRICO-ARYTENOIDEUS POSTICUS.	Arises from the posterior part of the cricoid cartilage.	Inserted into the basis of the arytenoid.	Opens the glottis.
CRICO-ARYTENOIDEUS LATERALIS.	Arises from the lateral part of the cricoid cartilage.	Inserted into the outward side of the arytenoid.	Opens the glottis.



THYREO-A- RYTENOIDÆ- US.	Arises the whole length of the internal concave part of thyreoid cartilage.	Infered into the internal part of the basis of the arytenoid.	Assists in contracting the aperture of the glottis.
CEPHALO- PHARYNGE- US.	Arises from the cuneiform process of the os occipitis.	This and the ten following muscles form the pharynx.	
Chondro-pha- ryngæus.	Arises from the graniform appendage of the os hyoides.		
Crico-pharyn- gæus.	Arises from the cricoid cartilage.		
Glosso-pharyn- gæus.	Arises from the basis of the tongue.		
Hyo-pharyn- gæus.	Arises from the horn of the os hyoides.		
Pterigo-pha- ryngæus.	Arises from the pterigoid process of the sphænoidal bone.		

NAME.	ORIGIN.	INSERTION.
SALPINGO-PHARYNGEUS.	Arises from the extreme part of the eustachian tube.	All these muscles, from their various origins, meet their fellows, from the opposite side, and unite in a middle tendon — together they form a muscular bag, to which the food after mastication is transmitted, and, by their action, is thence propelled into the œsophagus.
<i>Syn-des-mo Pha-ryngæus.</i>	Arises from the root of the stili-form process.	
<i>Stilo-pharyn-gæus.</i>	Arises from the lateral part of the thyroid cartilage.	
<i>Thyre-o-pha-ryngæus.</i>		



GLOSSO-STAPHILINUS.	Arises from the lateral part of the tongue.	Inserted near the middle of the uvula.	When one acts, the uvula is mov'd to a side,—when both act, is depressed.
PALATO-STAPHILINUS.	Arises from the future of the os palati.	Inserted into the side of the palati.	Moves the palate forwards and downwards.
SALPINGO-STAPHILINUS, seu Pteristaphilinus.	Arises from the anterior part of the eustachian tube.	Inserted into the basis of the uvula.	Moves the uvula upwards & backwards.
THYREO-STAPHILINUS.	Arises from the superior part of the thyroid cartilage.	Inserted into the uvula.	Shuts up the passage between the nose and mouth in deglutition.

NAME.	ORIGIN.	INSERTION.	USE.
PECTORALIS MAJOR.	Arises from one half of the anterior part of the clavicle, —from the lateral part of the sternum, —from the cartilages of the fifth and sixth ribs.	Inserted into the outer ridge of the canal, into which the tendon of the long head of the biceps flexor is lodged.	Brings the arm inwards, and depresses it, when raised.
PECTORALIS MINOR, <i>seu</i> <i>Serratus Mi-</i> <i>nor Anticus.</i> <i>Subclavius.</i>	Arises from the third, fourth and fifth ribs.	Inserted by a short round tendon into the coracoid process of the scapula.	Assists the former in depressing the arm, and bringing the scapula forwards.
	Arises tendinous from the under part of the scapular extremity of the first rib, and passing obliquely between the clavicle and first rib.	Is inserted into the superior part of the first rib, near the ligament by which it is tied to the clavicle.	Depresses the scapular extremity of the clavicle.



<i>Intercostales Externi.</i>	Arise from the inferior margin of each rib, and running obliquely forwards.	Are inserted into the superior margin of the rib below.	Raise the ribs and enlarge the cavity of the chest.
<i>Triangularis Sterni.</i>	Arises from the internal part of the xiphoid cartilage, from the lateral inferior parts of the sternum.	Running obliquely upwards and outwards, is inserted in the cartilages of the third, fourth and fifth ribs.	By depressing the ribs, contracts the cavity of the chest.
<i>Intercostales Interni.</i>	Arise like the former, and passing obliquely, decussate the external.	Inserted into the upper margin of each rib.	Raise the ribs.
<i>Depressores Costarum Pro- prii.</i> —Ten pairs in number.	Arise from the internal part of the rib, near its articulation with the transverse process of the vertebræ.	Passing obliquely upwards and forwards, are inserted into the inferior margin of the rib above.	Depress the ribs and contract the cavity of the chest.
<i>Trapezius.</i>			

## NAME.

*Trapezius*  
*vel Cucu-*  
*laris.*

## ORIGIN.

Arises by a short tendon from the middle part of the transverse occipital ridge,—from the ligamentum colli,—from the spinous process of the last vertebra colli,—from the spinous processes of the ten superior vertebræ dorsi.

## INSERTION.

The fibres, from the superior part, passing obliquely round the back part of the shoulder, are inserted into the upper portion of the extremity of the clavicle and into the processus acromion, —all the middle and lower part, into the whole length of the spine of the scapula.

## USE.

The fibres of this muscle running into different directions, different parts acting independent of the whole, will produce different effects;—the middle portion moves the scapula backwards;—the upper portion raises it obliquely;—the inferior portion depresses and carries it backwards.



<i>Latissimus Dorsi.</i>	Arises by a broad thin tendon from the posterior part of the ilium,--from the spinous processes of the os sacrum,--from all those of the vertebræ lumborum, and from the spinous processes of the seven or eight inferior vertebræ dorsi, below the rhomboides.	A small slip is inserted into the inferior angle of the scapula,--the remaining part passing on, forms the outer fold of the axilla, and is inserted into the outer part of the biceps muscle, is lodged opposite to the insertion of the pectoralis major.	Depresses the arm, and carries it backwards.
<i>Elevator Scapulae, seu Musculus Pectoralis.</i>	Arises, by slips, from the transverse processes of the four superior vertebræ colli.	The slips uniting form one muscle, which is inserted into the superior angle of the scapula.	Raises the scapula, and depresses the arm when raised.
			<i>Rhom-</i>

NAME.	ORIGIN.	INSERTION.	USE.
<i>Rhomboi- des Minor.</i>	Arises from a part of the ligamentum colli and the spine of the vertebra colli.	Is inserted into that part of the basis of the scapula, which is above the spine.	Carries the superior angle of the scapula upwards and backwards.
<i>Rhomboi- des Major.</i>	Arises from the spinous processes of the four or five superior vertebræ dorsi.	Is inserted into all that part of the basis of the scapula below the spine.	Carries the scapula obliquely upwards and backwards.
<i>Serratus Minor Anticus.</i>	Arises by slips from the eight superior ribs.	Is inserted into the whole length of the basis of the scapula on its inner side.	Rotates the scapula on its axis in the motion of the arm, and in strong efforts, raises the ribs.



*Serratus  
Superior  
Posticus.*

Arises, by a broad thin tendon, from the lower part of the ligamentum colli, —from the spinous processes of the last vertebra of the neck, —from the spines of the three superior vertebræ of the back.

Is inserted into the second, third, and fourth ribs by distinct slips.

By raising the ribs, enlarges the cavity of the chest.

*Serratus  
Inferior  
Posticus.*

Arises, by a broad thin tendon, from the spinous processes of the two inferior vertebræ dorsi and of the two superior vertebræ lumborum.

Is inserted into the inferior margin of the three or four last ribs, passing obliquely upwards.

Depresses the ribs in expiration.

## NAME.

*Splenius.*

## ORIGIN.

Rises, by several long small tendons, from the spines of the four superior vertebræ dorsi,—from that of the seventh vertebra of the neck, and from the whole ligamentum colli:—this ligament principally formed by the union of the tendons of the two splenii, extending from the spinous process of the second vertebra colli to that of the last.

## INSERTION.

Is inserted into the transverse processes of the first and second vertebræ colli,—into the mastoid process and a part of the occipital ridge.

## USE.

When one muscle acts, it counteracts the mastoidæus: when the two act, the head is carried backwards.



<i>Complexus.</i>	Arises by tendons, from the transverse processes of the six, or seven superior vertebræ dorsi, and from the transverse processes of the six inferior vertebræ colli.	Inserted into the under part of the os occipitis.	When one acts, the head is carried to a side—when both act, the head is bent—ed, is raised, and carried backward. Assists the complexus.
<i>Trachelo-mastoidæus, seu par tertium Fallopii.</i>	Arises by slips from the transverse processes of the two superior vertebræ dorsi, from those of the three or four inferior vertebræ colli.	Passing up the neck, under the spleneus, is inserted by a thin tendon into the middle posterior part of the mastoid process.	
<i>Rectus major costicus.</i>	Arises from one point of the spinous process of the second vertebræ colli.	Passing obliquely upwards and outwards, is inserted into the os occipitis, behind the complexus.	Raises the head, and bends it a little backwards.

N A M E.	O R I G I N.	I N S E R T I O N.	U S E.
<i>Rectus minor posticus.</i>	Arises from a small tubercle on the back part of the atlas.	Inserted into the os occipitis behind the foramen magnum occipitale.	Assists in raising the head.
<i>Obliquus inferior.</i>	Arises, from the transverse process of the atlas.	Inserted into the os occipitis, near the back part of the mastoid process.	Moves the head a little obliquely.
<i>Obliquus inferior.</i>	Arises from the spine of the dentata.	Inserted into the transverse process of the atlas.	Rotates the head.
<i>Rectus internus major.</i>	Arises from the fore part of the transverse processes of the 3d, 4th, 5th and 6th vertebræ colli.	Is inserted into the cuneiform process of the os occipitis.	Bends the head forwards.
<i>Rectus internus minor.</i>	Arises from the fore part of the body of the atlas.	Inserted into the fore part of the foramen magnum.	Assists the former muscle.
<i>Rectus lateralis.</i>	Arises from the transverse process of the atlas.	Inserted near the mastoid process, into the os occipitis.	Bends the head a little to a side.



<i>Musculus Caput concutiens.</i>	Arises from the oblique processes of the second and third vertebræ colli.	Inserted into the root of the transverse process of the atlas.	Bends the head a little to a side.
<i>Scalenus, divided into 4 muscles.</i>	First, arises from the transverse processes of the fourth, fifth, and sixth vertebræ colli. The second, arises by distinct tendons, from the transverse processes of the 2d, 3d, 4th, 5th and 6th vertebræ colli. The third, arises from the transverse processes of the fifth and sixth vertebræ of the neck. The fourth, arises from the transverse processes of the two last vertebræ colli.	Inserted into the first rib, near its cartilage.  Inserted into the superior middle part of the first rib.  Inserted into the upper part of the second rib.  Inserted into the posterior part of each rib, near the tubercle.	These four parts of the scalenus, by raising the ribs, enlarge the cavity of the chest.

*Longus*

NAME.	ORIGIN.	INSERTION.	USE.
<i>Longus colli.</i>	Arises from the bodies of the four, or five superior vertebræ dorsi.	Inserted into the sides of the bodies of the four inferior vertebræ colli.	Bends the spine.
<i>Sacro Lumbalis.</i>	Arises in common with the longissimus dorsi.	Inserted by slips into each rib, near its angle.	Depresses the ribs, & raises the trunk.
<i>Accessorius ad Sacro lumbalem.</i>	Arises by slips from the eight or nine superior ribs.	Inserted fleshy into the rib immediately below, lying within the attachments of the sacro-lumbalis.	Assists the former muscle in depressing the ribs.
<i>Cervicalis descendens.</i>	Arises from the transverse processes of the 3d, 4th, fifth and sixth vertebræ colli.	Inserted into the 3d, 4th, 5th, 6th and 7th ribs, between the slips of the sacro-lumbalis and longissimus dorsi.	Raises the ribs in inspiration.
<i>Levatores costarum proprii.</i>	Arises from the transverse processes of the vertebræ dorsi, and running obliquely forwards and downwards;	Are inserted into the upper edge of each rib, except the first.	Raise the ribs, and enlarge the cavity of the chest in inspiration.



*Longissimus  
dorsi.*

Arises from the fascia lumborum, from the spinous processes of the sacrum, from the posterior part of the spine of the ilium—from the spinous and transverse processes of the vertebræ lumborum, and at its origin, is blended with the sacro-lumbalis.

Arises from the transverse processes of the six inferior vertebræ dorsi.

*Spinalis colli.*

Arises from the transverse processes of the five superior vertebræ dorsi.

Has a double insertion by slips, into each rib, one slip being attached near the tubercle of the rib, the other midway between the angle and tubercle.

Depresses the ribs and raises the spine.

*Semi-spinalis.*

Inserted into the spines of the six superior vertebræ dorsi, and into that of the last vertebra colli.

Extends the spine

Passing obliquely under the complexus, is inserted into the spines of the 2d, 3d, 4th and 5th vertebræ colli.

Extends the spine, and raises the head.

*Trans-*

NAME.	ORIGIN.	INSERTION.	USE.
<i>Transversalis colli.</i>	Arises from the oblique processes, of the four inferior vertebrae colli.	Inserted into the roots of the spines of the superior vertebrae colli.	Raises the head, and moves it obliquely backward. Extend the spine.
<i>Inter-spinales colli.</i>	Arise from the points of the spinous processes, on their lower part.	Are inserted into the spinous processes, immediately beneath them.	Bend the neck laterally.
<i>Inter-transversales colli.</i>	Arise from the lower part of the transverse process of the vertebra above.	Are inserted into the upper part of the transverse process of the vertebra below.	Bend the neck a little to a side.
<i>Inter-vertebrales.</i>	Arise from the fore part of the body of the vertebra above.	Passing obliquely are inserted into the side of the body of the vertebra below.	Bend the spine laterally and raise it.
<i>Transversales dorsi inferiores.</i>	Arise from the transverse processes of all the vertebrae.	Are inserted by a distinct slip, into the spinous process of each vertebra.	



<i>Spinales lumborum.</i>	Is blended with the sacrolumbalis, and longissimus dorsi.	Inserted into the spinous processes of all the vertebrae lumborum.	By raising the lumbar vertebrae, extend the spine. Assists the former.
<i>Transversalis lumborum.</i>	Arises from the oblique processes, of all the vertebrae lumborum.	Inserted into the spines of all the lumbar vertebrae.	
<i>Inter-transversalis lumborum.</i>	Are placed between all the transverse processes.		Bend the spine laterally.
<i>Quadratus lumborum.</i>	Arises from the inner labrum of the posterior part of the spine of the ilium.	Inserted into the transverse processes of the vertebrae lumborum, and into the last rib.	When one acts, the spine is bended to a side; when both act, the body is bended forwards.
<i>Psoas parvus.</i>	Arises fleshy from the side of the superior lumbar vertebra.	Is inserted by a long tendon, into the brim of the pelvis.	Bends the spine on the pelvis, or raises the pelvis towards the spine.

N A M E.	O R I G I N.	I N S E R T I O N.	U S E.
<i>Psoas magnus.</i>	Arises from the side of the body of the last dorsal vertebra, from the bodies and transverse processes, of all those of the loins.	Passing over the brim of the pelvis, joins the tendon of the iliacus internus, and is inserted into the little trochanter.	Bends the thigh, and carries it forward in progression.
<i>Iliacus internus.</i>	Arises from all the internal surface of that part of the os-ilium, which is above the brim of the pelvis.	Passing over the brim of the pelvis, its tendon joins with that of the former muscle, both having one common insertion.	Assists the former.
<i>Pectinalis.</i>	Arises from the superior, and interior part of the os-pubis.	Inserted into the femur, a little below the little trochanter.	Bends the thigh forwards, and raises it.



*Glutæus maximus.*

Arises from the superior part of the os coccygis, from all the spinous processes of the sacrum, from all the outer part of that bone below the spine of the ilium, from the sacro-sciatic ligaments, from the posterior superior part of the spine of the ilium, and from the fascia, which covers the glutæus medius.

From these attachments it passes down to be inserted by a large broad tendon, into the femur, a little below the great trochanter.

Extends the thigh, and carries it backwards.

*Glutæus medius.*

Arises from all the outer surface of the ilium, before that space covered by the glutæus maximus.

Inserted by a broad tendon, the whole length of the great trochanter.

Assists the former.

*Glutæus*

NAME.	ORIGIN.	INSERTION.	USE.
<i>Glutæus Minimus.</i>	Arises from the inferior, posterior part, of the os ilium.	Inserted into the great trochanter.	Assists the two former in extending the thigh.
<i>Pyriformis, seu Iliacus Externus.</i>	Arises from the inferior part of the os sacrum, and from the os ilium near the sciatic notch.	Inserted into the cavity, at the root of the great trochanter.	Raises the thigh, and turns the toes outwards, by rotating the femur.
<i>Gemini.</i>	The superior arises from the spine of the ischium,—the inferior, from the inside of the tuberosity of the same bone.	Surrounding the tendon of the marfupialis, are inserted into the cavity at the root of the great trochanter.	By rotating the thigh bone, turn the toes outwards.



<i>Marsupialis,</i> <i>vel Obturator</i> <i>Internus.</i>	Arises from the ligament which covers the obturator hole, and from the edges of the bone.	Inserted into the cavity, at the root of the great trochanter.	Rotates the thigh bone obliquely outwards.
<i>Quadratus</i> <i>Femoris.</i>	Arises from the exterior side of the tuberosity of the ischium.	Passing transversely, is inserted into a space between the two trochanters.	Carries the thigh backwards, and is a rotator.
<i>Triceps,</i> —a title given to the four fol- lowing mus- cles,— <i>Ad-</i> <i>ductor Fem-</i> <i>oris Primus.</i>	Arises, by a strong tendon, from the superior anterior part of the os pubis.	Inserted into the linea aspera, near the middle of the thigh bone.	

NAME.	ORIGIN.	INSERTION.	USE.
<i>Adductor Femoris Secundus.</i>	Arises, by a broad tendon, from the os pubis, immediately under the gracilis.	Inserted into that part of the linea aspera, from the little trochanter to the insertion of the former muscle.	These four muscles, in their action, produce similar effects.
<i>Adductor Femoris Tertius.</i>	Arises from the exterior margin of the os pubis and ischium, a little below the former.	Inserted near the tendon of the glutæus maximus.	
<i>Adductor Femoris Quartus.</i>	Arises from the tuberosity of the ischium, and from its inner side.	Is inserted by a long round tendon, into the whole length of the linea aspera.	In progression, they bend the thigh bone, and draw it inwards.



<i>Obturator Externus.</i>	Arises from the outer edge of the obturator hole, and from the ligament which covers it.	Inserted, by a strong tendon, into the cavity, at the root of the great trochanter.	Rotates the thigh bone, and turns the foot outwards.
<i>Coccygæus.</i>	Arises from the spine of the ischium, and from a part of the sacro sciatic ligament.	Inserted into the whole length of the os coccygis.	Raïses the os coccygis.
<i>Musculus Membranosus.</i>	Arises from the anterior, superior spinous process of the ilium, is blended with the tendinous expansion of the glutæus medius.	Forms the fascia of the thigh, and is inserted into the upper extremities of the tibia and fibula.	Extends the tibia, and rotates the foot a little outwards.
<i>Sartorius.</i>	Arises from the anterior superior spine of the ilium.	Passing obliquely round the fore part of the thigh, is inserted into the inner side of the head of the tibia.	Bends the leg.
<i>Rectus Cruris.</i>	Arises from the anterior superior spine of the ilium,	Is inserted into the basis of the patella.	Extends the leg.
			<i>Vastus</i>

N A M E.	O R I G I N.	I N S E R T I O N.	U S E.
<i>Vastus Extensor.</i>	Arises from all the outer part of the femur, from the great trochanter to its lower extremity.	Is inserted into the basis of the patella.	Extends the leg.
<i>Vastus Internus.</i>	Arises from the inside of the femur, from the little trochanter to the inner condyle.	Inserted into the upper part of the patella.	Extends the leg.
<i>Cruræus.</i>	Arises from the fore part of the thigh bone, joins the tendon of the three former muscles, and	Is inserted into the basis of the patella.	Extends the leg.
<i>Gracilis.</i>	Arises, by a broad thin tendon, from the os pubis, near the symphysis.	Inserted into the inner side of the tibia, near its head.	Bends the leg.



<i>Seminervosus, five Semiten- dinosus.</i>	Arises from the tuberosity of the ischium.	Inserted into the inner posterior spine of the tibia, about an inch below the insertion of the ligament of the patella.	Bends the leg.
<i>Seminembranosus.</i>	Arises from the tuberosity of the ischium.	Inserted into the posterior side of the tibia, near its head.	Bends the leg.
<i>Biceps.</i>	Arises by two heads, the longer, originating from the tuberosity of the ischium, descends and joins with the shorter head, which arises from the linea aspera.	Inserted into the outer part of the head of the fibula:	Bends the leg.
<i>Gastrocnæmus.</i>	Arises by two heads,—one from each condyle of the femur.	Below the joint, these unite in one common tendon,—inserted into the os calcis.	Extends the foot.

*Soleus.*

N A M E.	O R I G I N.	I N S E R T I O N.	U S E.
<i>Soleus.</i>	Arises from the posterior parts of the tibia and fibula,—joins with the tendon of the gastrocnæmius.	This and the former muscle have one common tendon, called tendo achillis.	Affists the former muscle in extending the foot.
<i>Plantaris, vel Extensor Tarsi Minor.</i>	Arises from the outer condyle of the femur, and capsular ligament of the joint of the knee.	Its tendon passes obliquely between the tendons of the two former muscles, and is inserted into the os calcis.	Raises the foot, and draws down the capsular ligament of the knee.
<i>Tibialis Anticus.</i>	Arises from the outer side of the tibia, near its upper part: Some of its fibres originate from the fascia of the leg.	Passing under the annular ligament, is inserted into the os cuneiforme internum.	Bends the foot.



<i>Tibialis Posterior.</i>	Arises from the posterior superior part of the tibia, from the fibula and interosseous ligament.	Its tendon, passing under the malleolus internus, is inserted into the upper and inner part of the os naviculare.	Extends the foot.
PERONÆUS LONGUS, seu <i>Peronæus Primus, seu Possicus.</i>	Arises from the upper extremity of the fibula.	Its tendon, playing over the os cuboides, is inserted into the os cuneiforme internum, and first bone of the great toe.	Moves the foot outwards, and bends it.
PERONÆUS SECUNDUS, <i>vel Anticus.</i>	Arises from the anterior middle part of the fibula.	Is inserted into the metatarsal bone sustaining the little toe.	Bends the foot.
PERONÆUS TERTIUS, seu <i>Nonus Vesalii.</i>	Arises from the inferior anterior part of the fibula.	Inserted into the metatarsal bone sustaining the little toe.	Bends the foot.

NAME.	ORIGIN.	INSERTION.	USE.
<i>Extensor Digitorum Communis Longus.</i>	Arises from the upper and outer side of the head of the tibia, and from the inner part of the fibula.	Its tendon, passing under the annular ligament, divides into four tendons, which go to be inserted into the bases of the second bones of the lesser toes.	Extends the toes.
<i>Extensor Digitorum Communis Brevis.</i>	Arises from the upper part of the os calcis and cuboid bone, is divided into four tendons.	These, joining the tendons of the former muscle, have a common insertion.	Assists the former.



<p>FLEXOR DIGITORUM COMMUNIS LONGUS, <i>vel perforans, vel flexor profundus.</i></p>	<p>Arises from the posterior superior part of the tibia: its tendon, passing under the malleolus internus, gets into the calcaneum.</p>	<p>Divides into four tendons, which are inserted into the last bones of the lesser toes.</p>	<p>Bends the toes.</p>
<p>PERFORATUS, <i>vel FLEXOR-SUB-LIMIS, vel flexor digitorum communis brevis.</i></p>	<p>Arises from the inferior part of the os calcis and fascia of the foot.</p>	<p>Divides into four tendons, which are inserted into the bases of the second bones of the lesser toes.</p>	<p>Bends the toes.</p>
<p>MASSA CAR-NEA, <i>vel musculus accessorius.</i></p>	<p>Arises from the calcaneum and fascia of the foot.</p>	<p>Is inserted into the tendon of the flexor longus.</p>	<p>Bends the lesser toes.</p>
<p><i>Lumbricales.</i></p>	<p>Arise from the tendons of the flexor longus.</p>	<p>Are inserted, by a broad tendon, into the first bone of each of the lesser toes.</p>	<p>Bend the first joints of the toes. <i>In-</i></p>

N A M E.	O R I G I N.	I N S E R T I O N.	U S E.
<i>Anterossii.</i>	Arise from the space between the metatarsal bones.	Are inserted into the first bones of the lesser toes.	Bend the first joints of the toes.
<i>Adductor minimi digiti.</i>	Arises from the bones of the tarsus, and from the metatarsal bone of the second toe.	Inserted into the side of the first bone of the little toe.	Draws the little toe inwards.
<i>Abductor minimi digiti.</i>	Arises from the os cuboides and from the metatarsal bone of the little toe.	Inserted into the outside of the first bone of the little toe.	Expands the foot by carrying the little toe outwards.
<i>Extensor pollicis pedis longus.</i>	Arises from the upper part of the fibula and interosseous ligament.	Inserted into the upper part of the last bone of the great toe.	Extends the great toe, and raises it.



<i>Extensor pol- licis p'ais bre- vis.</i>	Arises from the anterior inner part of the os calcis.	Infered into the upper part of the second bone of the great toe.	Extends the fe- cond joint.
<i>Flexor longus pollicis pedis.</i>	Arises from the superior posterior part of the fibula, near its head, and from a part of the interosseous li- gament.	Its tendon, passing under the malleolus internus, is infered into the basis of the last bone of the toe.	Bends the great toe.
<i>Flexor brevis.</i>	Arises from the cuboid and external cuneiform bones.	Infered into the sesamoid bones of the second joint of the toe.	Bends the second joint of the toe.
<i>Adductor pol- licis.</i>	Arises from the os calcis, from the cuneiform and cuboid bones, and from the metatarsal bone of the fe- cond toe.	Is infered into the second bone of the great toe.	Bends the toe and draws it in- wards.

*Adductor.*

NAME.	ORIGIN.	INSERTION.	USE.
<i>Abductor pollicis.</i>	Arises from the anterior inferior part of the os calcis, from a part of the os naviculare, and from the side of the first bone of the great toe.	Inserted into the external sesamoid bone of the second joint.	Bends the toe, and draws it outwards.
<i>Transversalis pedis.</i>	Arises from the sesamoid bone of the great toe, and from the metatarsal bone that sustains it.	Is inserted near the first joint of the lesser toe, and its metatarsal bone.	Contracts the foot and brings the toes towards each other.
<i>Deltoides.</i>	Arises from the scapular extremity of the clavicle, from the spine of the scapula, and processus acromion.	Inserted into the outer middle part of the os brachii.	Raises the arm.
<i>Supraspinatus</i>	Arises from that part of the scapula which is above its spine.	Inserted into the outer tubercle, near the head of the os brachii.	Raises the arm.



<i>Infraspinatus.</i>	Arises from that part of the scapula which is below its spine.	Is inserted into the outer tubercle, near the head of the os brachii.	Raises the arm and moves it backwards.
<i>Teres minor.</i>	Arises from the fore part of the costa scapulæ.	Is inserted into the outer tubercle, near the head of the os brachii.	Assists the former muscle.
<i>Teres major.</i>	Arises from the inferior angle and costa scapulæ.	Joins the tendon of the latissimus dorsi, and with it has a common insertion.	Moves the arm downwards and backwards.
<i>Coraco brachialis.</i>	Arises from the point of the coracoid process of the scapula.	Inserted into the middle inner side of the os brachii.	Raises the arm.
<i>Subscapularis.</i>	Arises from all the inner surface of the scapula.	Is inserted into the upper part of the os brachii.	Raises the arm and brings it towards the side.

NAME.	ORIGIN.	INSERTION.	USE.
<i>Biceps flexor cubiti.</i>	Consists of two heads; the longer arises from the neck of the scapula, and its tendon passing through the capsular ligament of the humerus plays over the head of the os brachii: is then lodged in a canal, made between the two tubercles near the head of the bone.	Near the middle of the arm joins with the shorter head which arises from the coracoid process of the scapula: inserted into the tubercle of the radius near the joint, sends off an aponeurosis; which is extended over the muscles on the inside of the fore arm.	Is a flexor of the fore arm and a supinator of the hand.
<i>Brachialis internus.</i>	Arises from the middle anterior and inferior part of the os brachii.	Inserted into the ulna, a little below the coronoid process.	Bends the fore arm.



<i>Biceps extensor cubiti.</i>	The long head arises from the inferior costa scapulæ,--the shorter, from the posterior part of the os brachii, almost its whole length. Arises from all that part of the os brachii, which is below the teres-major. Arises from the back part of the condyle of the os brachii.	Inserted into the external part of the ulna.	Extends the forearm.
<i>Brachialis extensor.</i>		Inserted into the olecranon, in common with the biceps extensor.	Extends the arm.
<i>Angonæus</i>		Inserted into the lateral part of the ulna, about an inch below the olecranon.	Affists the two former muscles in the extension of the forearm.
<i>Palmaris longus.</i>	Arises from the superior part of that ridge leading to the inner condyle.	Has a long tendon, which is inserted into the annular ligament of the carpus, and forms a part of the fascia in the palm of the hand.	Bends the wrist and tightens the fascia.

*Palmaris*

NAME.	ORIGIN.	INSERTION.	USE.
<i>Palmaris brevis.</i>	Arises from the metacarpal bone sustaining the little finger.	Its fibres passing transversely are inserted into the fascia in the palm of the hand.	Tightens the fascia.
<i>Flexor carpi radialis.</i>	Arises from the inner condyle of the os brachii, and from the upper part of the ulna.	Is inserted into the metacarpal bone that sustains the fore finger.	Bends the carpus and hand.
<i>Flexor carpi ulnaris.</i>	Arises with the former muscle, with which its fibres are intermixed.	Inserted into the os pisiforme.	Assists the former muscle.



EXTENSOR CARPI RADIALIS, seu bicornis.	Arises by two heads from the outer condyle of the os brachii.	Has two tendons of unequal length, the longer, inserted into the basis of the metacarpal bone sustaining the index—the shorter, into the metacarpal bone sustaining the middle finger. Inserted into the upper part of the metacarpal bone sustaining the little finger.	Extends the carpus and carries the hand a little backwards.
Extensor carpi ulnaris.	Arises from the outer condyle of the os brachii, from the outer part of the ancon, and from the outer edge of the ulna.		In its action assists the former muscle.
FLEXOR SECUNDI INTERNODII DIGITORUM COMMUNIS, seu perforatus.	Arises from the inner condyle of the os brachii, from the coronoid process of the ulna, and from the middle anterior part of the radius.	Divides into four tendons, passing under the annular ligament of the carpus—inserted into the basis of the second bone of each finger.	Bends the second joint of each finger.

*Flexor*

NAME.	ORIGIN.	INSERTION.	USE.
FLEXOR TERTII INTER-NODII DIGITORUM COMMUNIS, <i>seu perforans.</i>	Arises from all the upper outer part of the ulna, as it descends divides it into four tendons.	These pass under the annular ligament and are inserted into the basis of the last bone of each finger,—they pass through, or perforate the tendons of the former muscle.	Bends the last joint of each finger.
<i>Lumbricales,</i> four in number.	Arise from the upper tendons of the flexor digitorum.	Inserted by a broad tendon into the side of the basis of the first bone of each finger.	The tendons being expanded on the back parts of the fingers, these muscles bend the first joint and extend the others.



*Extensor digi-  
torum commu-  
nis.*

Arises from the external condyle of the os brachii, is blended with the *supinator brevis*, passing on the back part of the forearm, is divided into five tendons.

Extends the fin-  
gers.

*Interossei*, fix  
in number.

Are divided into external and internal, fill up the spaces between the meta-carpal bones,

Inserted into the sides of the basis of the first bones of the fingers.

Their tendons be-  
ing spread out on  
the backs of the  
fingers, bend the  
first joint, and ex-  
tend the other  
two.

*Extensor*

NAME.	ORIGIN.	INSERTION.	USE.
EXTENSOR SECUNDI IN- TERNODII INDICIS PRO- PRIUS <i>vulgo</i> <i>indicator.</i>	Arises from the middle pos- terior part of the ulna.	Inserted into the upper part of the basis of the second bone of the index.	Extends the fore finger.
<i>Extensor tertii internodii in- dicis.</i>	Arises from the outer part of the metacarpal bone, sustaining the fore finger.	Has two tendons, one in- serted into the side of the basis of the first bone, the other spread out on the back part of the finger.	Extends the last joint of the fore finger.



<i>Adductor indicis.</i>	Arises from the side of the first bone of the thumb.	Inserted into the bases of the first bone of the finger next the thumb.	Bends the first joint of the finger and brings it towards the thumb. Extends the little finger.
<i>Extensor minimi digiti.</i>	Arises from the outer condyle of the os brachii, and from the back part of the ulna.	Inserted into the last bone of the little finger.	
<i>Extensor tertii internodii minimi digiti.</i>	Arises from the inner side of the bones of the carpus, and from the metacarpal bone sustaining the little finger.	Inserted into the upper part of the first bone of the little finger.	Extends the third joint of the little finger.
<i>Abductor minimi digiti.</i>	Arises from the inner side of the bones of the carpus.	Inserted into the first bone of the little finger.	Carries the little finger outwards and bends the first joint.

*Flexor*

NAME.	ORIGIN.	INSERTION.	USE.
<i>Flexor primi internodii minimi digiti.</i>	Arises from the os unciniforme, and from the fore part of the metacarpal bone sustaining the little finger.	Inserted by two tendons, into the sides of the basis of the first bone of the little finger.	Bends the first joint and hollows the hand.
<i>Flexor tertii internodii pollicis.</i>	Arises from the fore part of the radius, a little below its tubercle.	Inserted into the basis of the third bone of the thumb.	Bends the last joint of the thumb.
<i>Flexor secundi internodii pollicis.</i>	Arises from the trapezium principally at its upper part, blended with the following muscle.	Inserted by two tendons, into the sesamoid bones, placed in the second joint of the thumb.	Bends the second joint of the thumb.
<i>Flexor primi internodii pollicis.</i>	Arises from the annular ligament of the carpus and from the trapezium.	Inserted into the internal lateral part of the first bone of the thumb.	Bends the first joint.

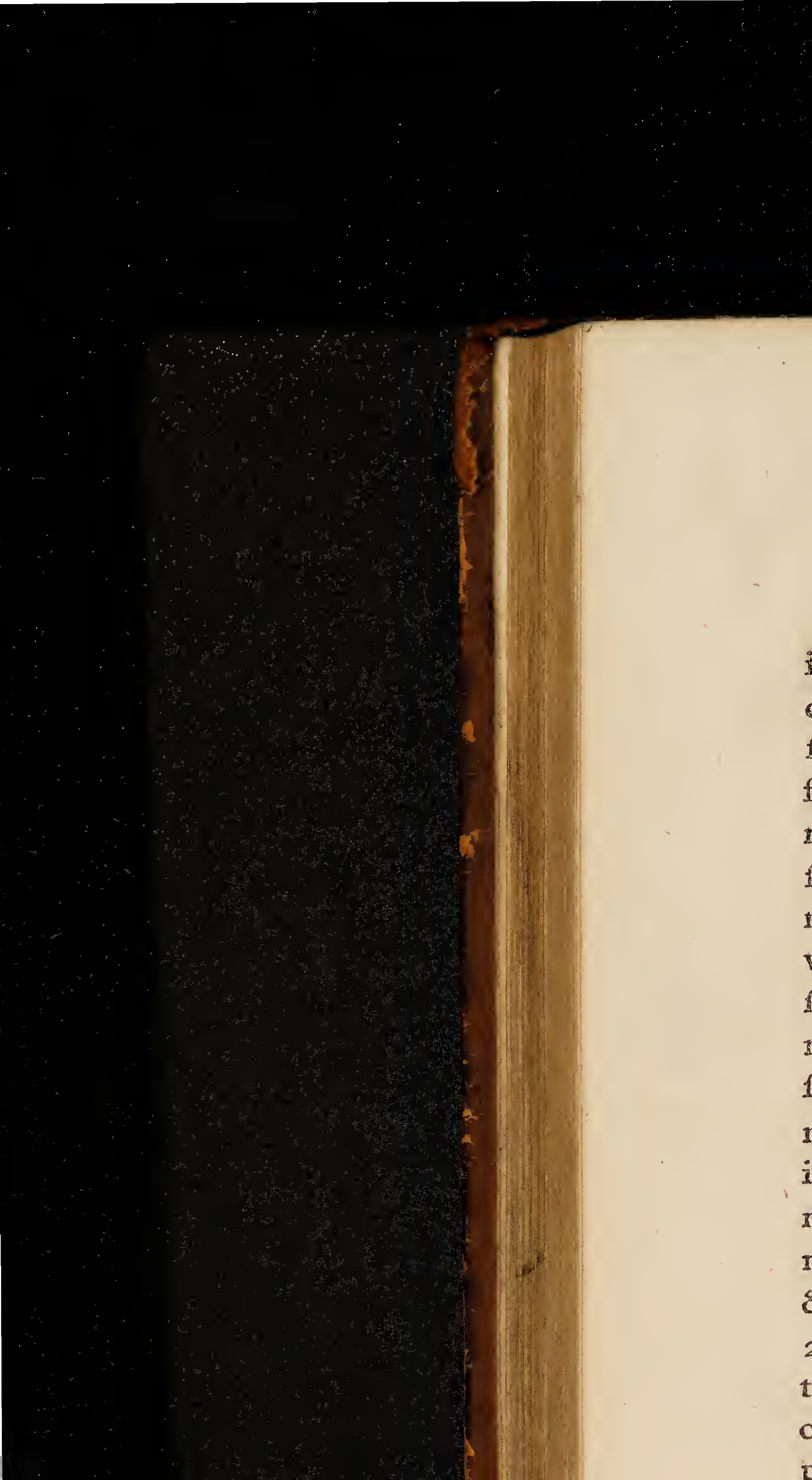


<i>Extensor primi internodii pollicis.</i>	Arises from the upper outer part of the ulna, from the interosseous ligament, and back part of the radius.	Inserted into the back part of the first bone of the thumb.	Extends the first joint.
<i>Extensor secundi internodii pollicis.</i>	Arises from the middle back part of the radius and interosseous ligament.	Inserted into the upper part of the basis, of the second bone of the thumb.	Extends the second joint of the thumb.
<i>Extensor tertii internodii pollicis.</i>	Arises from the middle back part of the ulna and interosseous ligament.	Its tendon, running in a sulcus at the lower extremity of the radius, is inserted into the last bone of the thumb.	Extends the last joint of the thumb.
<i>Abductor pollicis.</i>	Arises from the annular ligament of the carpus, from the trapezium and trapezoides.	Inserted into the outer part of the second bone of the thumb.	Moves the thumb outwards.

N A M E.	O R I G I N.	I N S E R T I O N.	U S E.
<i>Adductor pol- licis ad indi- cem.</i>	Arises from the external lateral part of the metacarpal bone sustaining the index.	Inserted into the first joint of the thumb.	Brings the thumb towards the fore finger.
<i>Adductor pol- licis ad mini- mum digitum.</i>	Arises from the metacarpal bone sustaining the little finger.	Inserted into the second joint of the thumb, a little below the internal sesamoid bone.	Moves the thumb towards the little finger, and holds the hand.
<i>Pronator te- res.</i>	Arises from the internal condyle of the os brachii, from the anterior part of the ulna below the joint.	Passing obliquely, is inserted into the middle outer part of the radius.	Turns the palm of the hand inwards and downwards.
<i>Pronator quadratus.</i>	Arises from the lower inner side of the ulna.	Passing transversely, is inserted into the inferior outer part, of the lower extremity of the radius.	Assists the former muscle in the pronation of the hand.



<i>Supinator longus.</i>	Arises from the outer condyle of the os brachii, above the origin of the bicornis.	Inserted into the external part of the lower extremity of the radius.	Turns the palm of the hand upwards.
<i>Supinator brevis.</i>	Arises from the outer condyle of the os brachii, from the upper extremity of the ulna, and from the interosseous ligament.	Inserted into the radius, a little below the insertion of the biceps flexor.	Turns the palm of the hand upwards, and counteracts the pronators.





distance from each other, as the trochlearis. 3dly, Different parts of the same muscle can act independent of the whole, or of each other,—this is particularly seen in the Cucullaris, &c. 4thly, Some muscles produce different effects, according to the different degrees of their action, and the different position of the limb; for instance, when the hand is in a state of supination, the biceps flexor cubiti, is first a pronator of the hand, then a flexor of the fore-arm. 5thly, The effects of muscles are different, according to the nature of the parts into which they are fixed; those which pass from bone to bone, by their contraction, move them towards each other; but those which are inserted into soft parts not only move them, but likewise alter the figure of the part. 6thly, The effects of muscles are different, according to the number of them that act at the same time, *e. g.* If the flexors of the leg act alone, the limb will be bended, if the extensors act they extend it, but if both extensors and flexors act

at

at the same time, the leg will neither be bended nor extended. If, whilst a muscle is in action, we examine it, the following phænomena may be observed: 1st, It grows tense, and endeavours to shorten itself in the direction of its fibres. 2dly, It grows harder in proportion to the energy with which it acts. 3dly, It becomes shorter if not overpowered by a superior force: the degree of accurtation is in general about one third of its whole length; but in many muscles of the body, particularly those surrounding cavities, is considerably more. Muscles in acting do not become redder; on the contrary, if any change in the colour is produced, they become paler:—this circumstance not easily determined. 5thly, A muscle in action is not increased in bulk, when we take all its parts together; it swells, indeed, at a particular part, but its whole bulk is neither increased nor diminished. 6thly, Muscles are not naturally in a state of much tension; they have a tonic power, which enables them to adapt themselves to the position



position in which they are placed, constantly keeping the fibres in a straight line; this observation how far important in the practice of surgery. The power which muscles have, of contracting themselves, is not owing merely to their arteries, veins or nerves, but is dependent on their longitudinal fibres, which in man and quadrupeds are red, and of different colours in other animals. Yet this power is in a particular manner dependent on the nervous system, as appears from the following phenomena.

If a nerve going to a muscle, be irritated, the muscle is made to contract: This experiment has been frequently made on the diaphragm, by laying bare the phrenic nerve, and stripping it. Thence physiologists were led to suspect, that muscular fibres were hollow, and that contraction was produced by an influx of the nervous fluid into them. This idea was corrected, by observing that the experiment succeeds equally well, whether the nerves are stripped  
upwards.

upwards or downwards, and that irritation of any kind will produce the same effect. If a nerve going to a muscle be cut through, that muscle loses its power of contraction, though the effect is not immediate. Irritation of the brain produces contraction in the muscles that receive their nerves from that part of it, similar to irritation made on the nerves in any part of their passage, from the brain to the muscles they supply; hence spasmodic contractions and convulsions produced from irritation on the brain; *e. g.* Compression of the brain produces the same effects as the division, or compression of a nerve; therefore, if blood or matter be extravasated, paralysis will frequently ensue; all these phenomena shew so strong a connection between the nervous and muscular fibres, that some physiologists have suspected, that muscular fibres were only modifications of the nervous fibre. The nervous influence is not only necessary for muscular action, but an influx of blood seems also requisite; for if a muscle be deprived  
of



of blood by the division of its arteries, that muscle not only suffers from want of nourishment, but also becomes paralytic, and this takes place in so short a time, that some physiologists have supposed, that muscular fibres were formed by a chain of hollow vesicles, and that muscular contraction was produced by blood flowing into and distending them. Blood is not the efficient cause of contraction, though a *causa sine qua non*. An inquiry into the different theories that have been invented to explain muscular contraction. This power of contraction is excited by stimuli, which are either corporeal, or mental, and is termed irritability. Muscles differ from one another in being more or less influenced by the mind; the greater number of muscles are obedient to the will, and the mind, when she pleases, makes them contract, these we call voluntary muscles; but some muscles, intestines, &c. act involuntarily; some muscles are of a mixed kind, as those of respiration, being partly voluntary, and partly involuntary; at birth, all muscles are involuntary, the child moving the limbs in

all directions, as excited by particular feelings. By degrees the mind acquires a power over most of the muscles, so as to be able to direct their contraction; this power at first is very imperfect; as the power which the mind has over the muscles is acquired, so it can be lost, if discontinued; this seems to be partly the case in the limbs of those who have been long bed-ridden. Muscles, if long disused, will degenerate into mere cellular membrane;—this fact deserves particular attention. The mind's power over the muscles is not limited; nor is the force they are capable of exerting, so confined, as we might be led to suspect. That the influence of the mind, and the power of action is increased by frequent use, is evinced, by observing, that we use the right hand with greater alacrity, than the left; and that the muscles frequently used, act with greater energy than others, is proved by observing that the right arm of a fencing master, is stronger and larger, than the left. The  
ab-



absolute force of a muscle, is the whole power it is capable of exerting, the relative force, the weight it is capable of raising, or displacing. Muscles lying parallel to the bones, and being inserted near to the centre of motion, lose considerably of their absolute force;—if muscles were inserted into bones at right angles, they would have raised a weight as much heavier than that they are now capable of raising, as a right angle is greater than the angles they now make, but this disadvantage is compensated by the quickness of our motions.—Muscular contraction continues no longer than a stimulus is applied, therefore muscles are alternately contracted and relaxed. In all voluntary motions, the mind applies the stimulus.—Besides the contraction which muscles have on being irritated, they have a natural tendency to adapt themselves to the space into which they are placed,—this the *vis tonica*.—This power continues a short time after life, and to this power, is  
owing

owing the contraction of hollow muscles, when not distended mechanically.—Reflections on the combined actions of muscles.

END OF THE THIRD SECTION.



---

## Section the Fourth.

---

### On *ANGIOLOGY*.

**A** General account of the situation of the heart, and of the circulation of the blood.—The office of arteries, to carry blood from the heart, to the distant parts of the body.—The office of veins, to return that blood to the heart, when the purposes of the animal œconomy have been effected.—Arteries, two in number,—arteria pulmonalis, arising from the right ventricle of the heart,—aorta, arising from the left ventricle,—these arteries, as they originate from the heart, decussate each other;—every part of the body receives blood from the branches of the aorta, for the various purposes of nutrition, vivification and secretion.—The branches of the aorta are distin-

F f

guished

guished by particular names, descriptive of their situation and offices.—— The aorta, though originating from the left ventricle of the heart, is placed on the right of the spine:—— from the left ventricle, it ascends as high as the joint between the first and second bones of the sternum; this part called *sinus aortæ*;—then bending to the left of the spine, forms an arch called *curvature* of the aorta;——between the beginning of the aorta and left ventricle, three valves, called *valvulæ semilunares*, are placed:——these prevent the return of blood from the aorta into the ventricle.——The arteries coming from the aorta, arise in the following order.

*Arteriæ coronariæ*, reflected from the aorta;—their orifices being covered by the *valvulæ semilunares*, are distributed to the heart.

*Arteriæ thymicæ*, arise from the *sinus aortæ*,—large in the fœtus,—supplying the thymus gland with blood.—In the adult, small, and principally distributed to the anterior mediastinal space.

from



From the curvature of the aorta, arise three vessels;—the first, being anterior, is the common trunk of the carotid and subclavian on the right side,——the second, left carotid,——third, left subclavian.

*Carotid artery* ascends on the fore part of the neck, on the side of the trachea arteria, as high as the angle of the lower jaw, without giving off any branch: here, divides into two trunks, called external and internal carotid.——External, divided into the five following branches.

*Thyroidæa superior*, or superior guttural,—supplies the superior part of the thyroid gland.

*Sublingualis*, —— passing under the mylo hyoidæus, is distributed to the surface of the tongue,—to the muscles that move it, and to some muscles of the pharynx.

*Facialis*, —— bends under the jaw and sends off a branch to the chin, called *genial*;——thence, passing over the basis of the jaw, near the anterior edge of the massiter, ascends on the side of the cheek,—sends a branch to the lower lip, called *inferior*

*labial*,—one to the upper lip, called *superior labial*, — a branch to the nose, called *nasal*,—and some small branches to the muscles and skin of the face. —The remaining part of the trunk, passing between the nose and cheek, sends a branch through the foramen orbitale externum inferius,——then passing to the inner canthus of the eye, is called *angular artery*,——this sends a branch into the orbit, which anastomoses with a branch from the *arteria optica*. — The remaining branches are distributed to the muscles and skin of the forehead.

*Occipitalis* — passing behind the mastoideus and splenius, sends branches to the muscles and skin on the back part of the head,—these anastomose with the branches of the temporal artery.

*Superior maxillary* — passing within the process of the lower jaw, sends the *superficial temporal artery*, which passing through the parotid gland, supplies it with blood,—then ascending on the side of the head, and giving off branches to the adjacent parts, di-



vides into three branches,—the middle one passing immediately upwards, is distributed to the superior part of the scalp, and communicates with its fellow on the opposite side—the posterior passing obliquely backwards, communicates with the occipitalis,—the anterior running obliquely forwards, communicates with the branches of the facial artery.—The trunk lying within the process of the lower jaw, gives off branches to the pterigoid muscles,—the *deep seated temporal*, supplying the temporal muscle with blood, sends branches to Ichni-der's membrane,—to the antrum Highmorianum—and an artery, which passing through the foramen spinosum, is distributed to the dura mater.

*Internal carotid* or *cerebralis* passing through the spiral canal in the petrous portion of the temporal bone, runs on the side of the fella turcica,—sends off a branch, called *arteria optica*, which passing through the foramen opticum, is distributed to the eyeball and its appendages,—other branches from the internal carotids anastomose, with branches from the basilar

filary artery, and form a circle of communication round the sella turcica, called *circus arteriosus Willisii*;—the branches of the internal carotids are spread out on the pia mater, and supply the brain with blood.

*Subclavian*.—On the right side, separates from the carotid artery, and passing on nearly at a right angle, sends off the *inferior thyroid*, or *inferior guttural* artery,—this ascending on the side of the neck, gives branches to the œsophagus and trachea arteria,—then entering the lower part of the thyroid gland, communicates largely with the *thyroidea superior*,—the subclavian passing on a little further, gives off a large artery, called *vertebralis*, which, ascending through the canal formed by the holes in the transverse processes of the *vertebræ colli*, enters the *foramen magnum occipitale*;—on the *cuneiform process* of the *os occipitis*, the two *vertebral* arteries uniting, form the *basilar* artery.—The subclavian passing between the heads of the *scalenus* muscle, sends off some branches to  
the



the muscles of the neck, from whence running on towards the arm, and lying between the clavicle and first rib, it is lodged in a furrow on the upper part of that rib, and entering the axillary cavity, takes the name of *axillary artery*;—whilst in the axilla, it sends off a branch to the upper part of the scapula, called *scapular artery*;—three or four branches, called *thoracic* or external mammary—these supply some of the muscles on the side of the trunk in men, and the breasts in women;—a large branch passing near the inferior costa scapulæ, is called *inferior scapular*;—the trunk of the artery being seated near the head of the os brachii, sends off a branch which, surrounding the upper extremity of the os brachii, supplies with blood the deltoid, and parts about the joint,—this artery passing below the fold of the axilla, is called *brachial*,—lying on the inside of the arm, sends off branches to the skin and muscles of the arm,—besides these, are three branches, called anastomosing arteries, which communicate with branches,

branches that are reflected from the arteries seated below the joint of the cubit;—the superior arises from the upper part of the brachial artery;—the second, called *circumflexa*, near the middle of the arm;—the third, about an inch and a half above the joint of the cubit.——The brachial artery passing from the arm to the fore-arm, lies on the inside of the joint, and is covered by the fascia of the biceps muscle;—about an inch below the joint of the cubit, it sends off a large artery, called *radial*;——then descending a little further, and becoming deep-seated under the muscles on the inner side of the fore arm, divides into two branches;—the larger called ulnar, the smaller, interosseous.——*Radial*,—reflects an artery immediately below the joint of the cubit, which supplies the parts of the joints with blood, and anastomoses with the *circumflexa*.——The upper part of the artery lies on the fore part of the radius, and is covered by muscles,——descending, becomes more superficial,——near the joint of the carpus, sends a branch into the palm



palm of the hand, supplying the thumb;—then passing under the tendons of the extensor muscles of the thumb, gives off branches to the back of the hand;—the remaining part of this artery enters the palm, between the metacarpal bone sustaining the index and the first bone of the thumb, where it supplies the interossei muscles, &c. and communicates with the branches of the *ulnar artery*.

*Ulnar artery*,—like the radial, reflects a branch to the inner condyle of the arm, which anastomoses with the inferior branch of the brachial artery,—at its upper part, is covered by muscles,—near the wrist, becomes superficial,—passing over the annular ligament of the carpus, enters the palm of the hand, and sends a branch to each side of each finger: these branches anastomose frequently with the branches of the radial artery.

*Interosseous artery*,—lies upon the interosseous ligament, supplying the deep-seated muscles on the fore arm,—passing through a hole in the lower

part of the interosseous ligament, supplies the skin and muscles on the back of the hand.

Reflections on the peculiarities in the distribution of the blood vessels of the upper extremity.——Remarks on aneurisms.

*The subclavian artery*,—before it enters between the heads of the scalenus muscle, sends down a branch to the internal part of the thorax, called *internal thoracic*, or *mammary*; descending on the inner side of the sternum, sends branches to the anterior part of the intercostal spaces;—these anastamose with the anterior branches of the intercostal arteries;—sends branches to the anterior mediastinum, to the pericardium, and some large branches to the breast in the female, and to the integuments of the chest, in the male,——these anastamose with the external thoracics——the remaining branches pass down, on the fore part of the abdominal muscles, and communicate with some branches from the epigastric.

The



The aorta having formed its curvature, passes obliquely to the left side of the chest, and descending on the left of the spine, forms what is called *aorta descendens*,—this, whilst in the chest, sends off from the fore part, two or three small branches to the œsophagus, called *œsophagæal*,—these carry blood to the œsophagus;—also, a branch to each lung, named *broncheal*, and a few very small branches to the posterior mediastinal space;—from the lateral parts of the aorta, the *intercostal arteries* (ten pairs in number) arise; they run, at the superior part of each intercostal space, in a furrow made in the inferior edge of each rib,—as they approach the sternum, they branch irregularly, being sometimes at the lower part of the intercostal space—the anterior branches anastomose with the branches of the mammary, and those of the external thoracic arteries;—the intercostal arteries supply with blood the spaces between the ribs, send branches to the pleuræ, and others to the muscles and integuments situate on the outer parts

of the chest.—The aorta, whilst in the thorax, sends also some branches into the *theca vertebralis*, to the spinal marrow, &c. The aorta, as it descends, gets nearer to the fore part of the spine, and passing between the two crura of the diaphragm, enters the cavity of the abdomen;—it there sends off many large branches, some in pairs, and others which have no fellows, and, for this reason, are called *azygos*.

The *azygos arteries*, are three in number, distributed to the chylopoetic viscera,—the first, called *Cæliac*, arises from the fore part of the trunk of the aorta, where it passes through, between the two crura of the diaphragm:—divides into three branches;—first, *coronary*, is distributed to the lesser curvature of the stomach,—second, *hepatic*, runs towards the liver, and divides into two branches, one of which goes to each lobe of the liver:—in its passage, the *hepatic* sends off the *pylorica*, a branch which goes to the pylorus,—the *gastrica dextra*, going to the greater curvature of the stomach,

maeh,



mach,—the *duodenaes* small branches going to the duodenum, and, lastly, a branch going to the gall bladder.—

Third, *splenic*, is lodged in a fulcus of the pancreas, and supplies it with blood,—thence passing into the left hypochondrium, divides into several branches which enter the sinuosity of the spleen,—the splenic artery, in its passage, gives off four branches to the greater curvature of the stomach, called *vasa brevia* — the last being near the left extremity of the stomach, called *gastrica sinistra*. —

*Note. All the arteries of the stomach anastomose with each other.*—

The omentum receives many small branches from the *cœliac*,—those on the right side, arise from the *gastrica dextra*; those on the left, from the *splenic*,—on the right are called *gastro-epiploicæ dextræ*,—*sinistræ*, on the left.

*Mesenterica superior* is principally distributed to the small intestines,—on the left side, sends up a branch to the transverse arch of the colon, called *colica sinistra*.

*Me-*

*Mesenterica inferior*, sends branches to the lower part of the intestinal canal,—a large branch to the caput coli, called *colica dextra*,—this ascending anastamoses with the *colica sinistra*,—sends branches to the rectum, called *hæmorrhoidal*.——*Note, The two mesenteric arteries anastamose frequently with each other*; they supply the large and small intestines with blood.——

*Phrenic arteries*, sent off by the aorta in the abdomen, are reflected to the under surface of the diaphragm, supplying it with blood.—

*Capsular arteries*, are distributed to the renal capsulæ.—

*Emulgents*, carry blood to the kidneys, for the secretion of urine.—

*Spermatics*, arise below the emulgents, and commonly from the fore part of the aorta,—go to the testicles in the male,—to the ovaria in the female.

*Vertebral*,—three or four pairs in number, send branches to the loins, to the extensor muscles of the spine, and to the lateral parts of the *parietes* of the abdomen.

The



The aorta, descending as low as the body of the fourth lumbar vertebra, divides into two branches, called iliac;—this part commonly called bifurcation of the aorta;—the iliacs passing on the inner side of the psoas muscles, each divides into two branches, the one internal, the other external;—the internal iliac passing over the brim of the pelvis, gives branches to the bladder, called vesicales, — branches to the prostate gland and vesicula feminales;—branches to the muscles on the internal part of the pelvis, and to the external part of the anus.—Also a branch, which accompanying the obturator nerve, is distributed to the adductors of the thigh, called *obturator artery*.—The trunk, passing through the foramen magnum ischiï, sends off the glutæa to the glutæi muscles and skin of the nates.—Also sends off a large branch, which accompanies the sciatic nerves and anastomoses with the branches of the *profundæ*.—The *arteriæ pudicæ* running on the inside of the tuberosities of the ischium, enter the crura penis and

and carry blood for the erection of the penis.—External iliac, running on the fore part of the psoas muscle, at the lower part of the abdomen, just before it passes under Poupart's ligament, sends off two branches.—First, *ilio-lumbalis*, passing on the inside of the spine of the ilium, sends small branches to the iliacus internus and psoas muscles;—anastomoses with the vertebral arteries in the loins.—Second, *Epigastric*, is reflected to the abdominal muscles; and ascending on the inner side of the rectus abdominis, sends branches to the neighbouring parts, which anastomose with branches from the mammary.—The trunk having passed under Poupart's ligament into the thigh, sends off many small muscular branches to the muscles seated on the thigh;—also a large branch, which becoming deep-seated, goes to the joint of the thigh and muscles surrounding it.—A large branch, called *profunda*, conveying blood to the muscles on the back part of the thigh, and anastomosing with some branches of the internal iliac.—

The



The artery passing obliquely round the inner side of the thigh, gets into the ham, where it takes the name *popliteal*,—entering the leg between the two heads of the *gastrocnemius* divides into three branches,—the first passing through a hole in the *interosseous* ligament, comes on the outer side of the tibia, and descending on the fore part of the leg, is called *tibialis antica*,—passing under the annular ligament of the tarsus, sends a branch to the upper part of the foot, and one to the great toe ;—the trunk running between the bones of the tarsus, gets into the sole of the foot, gives branches to the deep seated muscles, and anastomoses with the *tibialis postica*.

*Tibialis postica*—the second branch, running on the posterior part of the tibia, gives branches to the muscles on the back part of the leg,—passing under the *maleolus internus*, gets into the *calcaneum*, and running under the fascia of the foot, sends branches to the skin, on the under side of the foot, and two branches to each

toe.—This artery makes frequent communications with the tibialis antica.—Peronæa or interossea, the third branch, passing on the inner of the perona, sends branches to the muscles and skin on the outer side of the leg,—running on to the maleolus externus, sends branches to the outer side of the foot.

Reflections on the communications of the arteries of the lower extremity, and on the aneurisms of this part.

### *Veins.*

Veins in the human body are seven in number, six of which terminate in the heart, viz. cava superior, cava inferior, four pulmonary veins, and the vena portarum, a vein peculiar to the abdominal viscera.

The blood carried from the left ventricle of the heart by the aorta, having performed the offices of nutrition, vivification and secretion, is returned to the right auricle by the two cavæ.—The blood carried from the heart by the branches of the aorta,



aorta, above the diaphragm, is returned by the branches of the cava superior—that below the diaphragm, by the cava inferior.—

When we trace the veins physiologically, we begin at the extreme parts of the body, but the best method for students, is to trace them anatomically, like the arteries, viz. from trunk to branch.—

The cava superior ascending from the heart, whilst in the chest, receives branches from the thymus gland, called *venæ thymicæ*;—small branches on the fore part, from the anterior mediastinal space;—receives the *vena azygos*, on its back part, returning the blood carried to the parts of the chest, by the intercostal arteries;—Also the internal thoracic vein attending on the mammary artery. — At the upper part of the chest, the cava divides into two branches, called subclavians;—that on the right side short,—that on the left long.—The left subclavian crosses the chest on the fore part of the large vessels arising from the curvature of the aorta.—The two subclavians have similar distribution.

ascending on the side of the neck, forms the internal or deep seated jugular passing on the outer side of the carotid artery.—Near the angle of the lower jaw, the internal jugular receives branches from the thyroid gland; also several small branches from the muscles on the neck,—it then divides into branches which accompany all the branches of the external carotid, except those that go to the face and side of the head,—and entering the thimble-like cavity in the basis of the skull, forms the sinuses of the dura mater, which receive the blood carried to the brain by the internal carotid.—Opposite to the first bone of the sternum, the left subclavian receives three or four small branches from the lower part of the thyroid gland and muscles on the fore part of the neck.

The subclavian passing towards the scalenus, sends off the external jugular, which ascending obliquely on the side of the neck, lies superficial under the platysma myhoides;—receives many small branches from the skin of the neck, near the angle of  
the



the jaw ;—also the temporal vein returning the blood from the temporal artery,—then passing over the basis of the jaw, accompanies the facial artery, sending branches to the different parts of the face, which receive the same names as are given to the arteries, to which they correspond.—The *angular vein* enters the orbit, and communicates with branches from the internal part of the skull.—*Note, The veins are less constant in their distributions than the arteries, in all parts of the body, but particularly in the head.*

—The external jugular frequently communicates with the internal, near the angle of the jaw,—in these instances the external one is wanting on the neck.—The subclavian passing on, towards the arm receives a large vein which ordinarily attends on the vertebral artery ;—also several small branches from the muscles and skin on the back of the neck,—then passing between the heads of the scalenus, it accompanies the artery to the arm,—between the clavicle and first rib, it is placed on the inner side next the sternum ;—

just

just before it passes under the clavicle, it receives the *cephalic vein* which running between the pectoral and deltoid muscles, passes on the outer part of the *biceps flexor cubiti*, and gets to the joint of the cubit, where it communicates with branches which come from the fore-arm. — *Note, The veins in the extremities are larger and more numerous than the arteries, — are divided into two sets; — one lying immediately under the skin, called superficial, — the other deep seated, accompany the branches of the artery; — in general two veins attend on each arterial branch: — these veins take the same names that are given to the arteries they accompany. — The axillary vein receives the external thoracic and superior scapular veins — descending on the inner side of the biceps flexor receives many muscular and small cutaneous branches. — A little above the joint of the cubit, receives the superficial veins from the fore arm. — The trunk passing under the fascia of the biceps becomes deep seated, and attends the radial, ulnar and interosseal arteries. — The super-*



perforial veins from the fore arm, at the joint of the cubit, form three branches, which communicate with each other ;—those from the back and outer part make the *cephalic* ;—those on the fore part, the *median* ;—and those on the inner side form the *basilic* ; all these are superficial at the joint of the cubit, and the two latter open into the deep seated vein, a little above the joint.——The vein coming from the little finger is called *vena saluatella*.——Reflections on the elective bleedings of the antients, with observations on phlebotomy.

*Vena cava* inferior passes through the centrum tendinosum of the diaphragm—is lodged in a sulcus of the liver,—receives from the liver the *venæ cavæ hepaticæ*, — and passing down on the right of the spine receives branches, in the following order :—The *phrenic veins* from the diaphragm ;—*capsular veins* from the renal capsulæ ;—*emulgent veins* from the kidneys ;—the *right spermatic vein*, and three or four small *vertebral veins*.——Note, The veins coming from the left side of the spine are longer than

than those on the right.—The cava attending the aorta at its bifurcation, divides into the two iliacs,—each iliac is divided into external and internal:—the internal passing over the brim of the pelvis, divides into branches which attend on the branches of the internal iliac artery, and receives the same names applied to the arteries they accompany.——The veins of the penis are two in number, one deep seated in dorso penis, placed in a sulcus between the corpora cavernosa, and called *vena magna ipsius penis*;—the other superficial, belonging to the integuments, called *vena tegmentorum*,—the two communicate near the symphysis pubis, under which they pass and open into the veins of the bladder.——The external iliac vein, passing on the inner side of the artery, runs under Poupart's ligament into the thigh.—On the inner side, it receives the trunk of the superficial veins of the leg and foot,—this called *vena saphena*, seated on the inside of the knee.—The deep seated vein accom-

panies



panies the artery to all parts of the lower extremity.

*For the peculiarities in the female, see female organs of generation.*

*Vena portarum*, is a vein peculiar to the viscera, and formed in the following manner:—the three azygos arteries having supplied the chylopoetic viscera with blood for the purposes of secretion, &c. that blood is returned by branches of veins, which every where accompany the arteries, except the hepatic branch,—all these veins unite and form a large trunk, which, instead of opening into the cava inferior like other veins, passes on to the liver, and enters its substance, at the part called *portæ* (from whence this vein takes its name;) then dividing into branches ramifies to all parts of the liver, carrying blood to it for the purpose of secretion, and is, *ex officio*, an artery.--The blood carried to the liver both by the *arteria hepatica* for nutrition, and by the *vena portarum* for secretion, is returned into the cava inferior, by three large and two or three small

veins, called *venæ cavæ hepaticæ*,—these pour their blood into the cava inferior, whilst it lies in a sulcus of the liver, or just before it passes through the *centrum tendinosum* of the diaphragm to open into the heart.

The veins of the heart, called *coronary*, open into the right auricle.

#### END OF THE FOURTH SECTION.











